READ TO SUCCEED

ENDLINE SURVEY REPORT

RTS Teacher Effectiveness (TE) Series # 9

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RTS Teacher Effectiveness (TE) Series # 9

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LIST OF ACRONYMS/ABBREVIATIONS

AIDS	Acquired Immune-Deficiency Syndrome
ANOVA	Analysis of Variance
CPD	Continuous Professional Development
DEBS	District Education Board Secretary
EFA	Education for All
EGRA	Early Grade Reading Assessment
ELM	Education Leadership and Management
GBS	Government Basic Schools
GRZ	Government of the Republic of Zambia
HIV	Human Immune-deficiency Virus
IR	Intermediate Result
MDG	Millennium Development Goals
MOGE	Ministry of Education, Science, Vocational Training, and Early Education
NBTL	New Break Through to Literacy
NISTCOL	National In-service Teachers' College (Now Chalimbana University)
OVC	Orphaned and Vulnerable Children
PALS	Phonological Awareness Literacy Screening
PEPFAR	United States President's Emergency Plan for AIDS Relief
PIRLS	Progress in International Reading Literacy Study
PLP	Primary Literacy Program
PMP	Performance Monitoring Plan
PTA	Parent Teacher Association
RTS	Read to Succeed
SACMEQ	Southern Africa Consortium for Monitoring Educational Quality
SESO	Senior Education Standards Officer
SIR	Sub Intermediate Result
SPRINT	School Program for In-service per Term
SPSS	Statistical Package for Social Sciences
UNESCO	United Nations Educational, Scientific, and Cultural Organization
USAID	United States Agency for International Development
USG	United States Government
ZANEC	Zambia National Education Coalition
ZPC	Zambia Primary Course

1.0.   EXECUTIVE SUMMARY

The USAID/Zambia Read to Succeed (RTS) Project works towards improving reading through improved school effectiveness in government primary schools in selected districts in six provinces: Eastern, Luapula, Northern, North-Western, Western, and Muchinga. As a follow up to the Baseline Survey conducted in 2012 and Midline Survey in 2014, the project conducted an Endline Survey in October/November 2016 to determine reading outcomes in early grades at the end of the project life. The survey also examined performance of school teachers, school head teachers, ministry officials' performance and general school assessment. Results presented in this report are important for future project management and are meant to provide evidence relevant for policy making in the education sector for the Ministry of General Education (MoGE), donors and other relevant stakeholders.

Survey Purpose:
The purpose of the survey was to compare learners' performance in 2012 before RTS's interventions started with their performance at the end of the project life. The survey results are also meant to inform stakeholders about effectiveness of project interventions and contribute to future project designs and implementation strategies.

Survey Methodology
RTS tested grade 2 and 3 learners reading ability in four local languages in 200 government/public primary schools in its six provinces of operation. A representative sample of 4,000 learners (2,000 grade 2 and 2,000 grade 3 i.e. 10 grade 2 and 10 grade 3 learners per school) were randomly selected from 200 schools across 16 districts (12 RTS and 4 non RTS-districts). The 4 non-RTS districts were selected based on 4 local languages in which EGRA was conducted; that is Icibemba, Chinyanja, Kiikaonde and Silozi. The schools were stratified by language and clustered by location (zone, district & province). The Early Grade Reading Assessment (EGRA) is a tool used to measure learners' progress toward learning to read. The EGRA tool was administered by trained assessors to one learner at a time. It examined learners' ability to perform fundamental pre-reading and reading skills. Apart from the EGRA sample, the survey also included a non-random sample of 2 teachers per school for grades 2 and 3 teachers (i.e. 1 teacher from each grade). The teachers were first observed teaching a reading lesson and later interviewed. The sample also included 200 head teachers. Head teachers were first interviewed and later they were asked to provide school statistics on different issues such as enrolments, dropout rates, pregnancy rates, progression rates and others. The survey limitation lies in the fact that EGRA is not a curriculum-based test and therefore does not assess what was taught in the classroom but overall competence gained by learners.

Summary Findings
<u>EGRA Results:</u> Endline Survey results showed that reading skills had improved in RTS supported schools across all EGRA sub tasks for both grades 2 and 3 learners in all six provinces. Performance improved from an average of 1.15 in 2012 to 10.44 correct words per minute in 2016. The graph summarizes performance by language.

Figure 1.1: Number of Correct Words Per Minute in ORF by Language
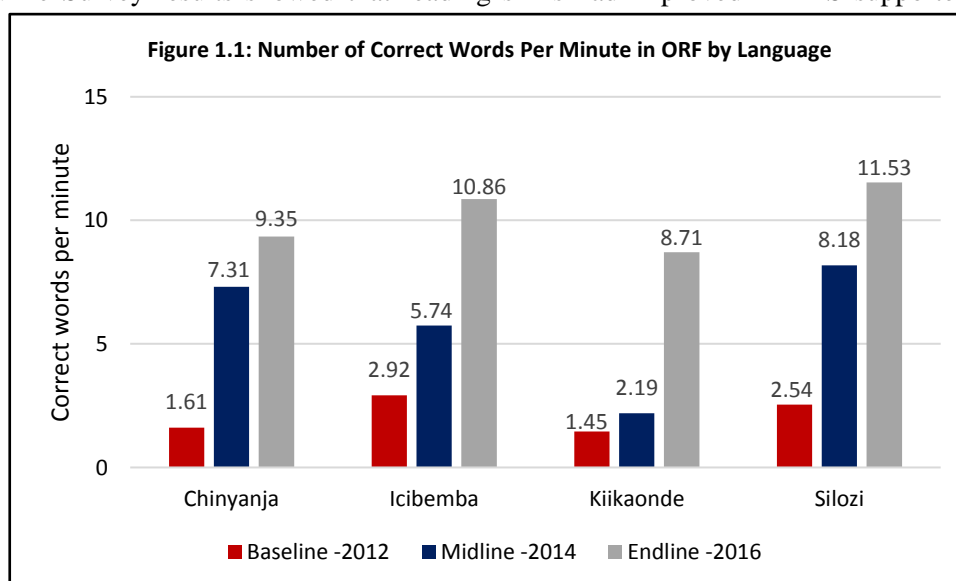
Grade 2 learners' performance showed more substantial percentage change than their counterparts in grade 3. For example, in 4 out of 7 subtasks tested at baseline, the Endline Survey results indicated that performance of grade 2 learners has increased by more than three-fold percentage points. In letter sound knowledge for example, performance improved from 38.1% to 79.6% for grade 2 and from 51.3% to 84.1% for grade 3; representing percentage points of 41.5% and 34.8% respectively. Improved achievements meant that there was significant reduction on zero scores. For example; zero scores reduced from 61.8% to 20.4% in letter sounds and from 90.0% to 52.6% for non-sense words for grade two learners. In oral reading fluency, zero scores reduced from 89.0% to 53.8% while in reading comprehension they reduced from 94.4% to 68%. Similar to baseline findings, endline results also showed that the most difficult task for learners is reading comprehension. Overall, results indicated that learners have substantially improved with respect to skills in letter sounds knowledge and basic reading skills but they still lack understanding of what they read. In all subtasks, girls performed slightly better than boys at endline, which was a shift from the pattern observed at baseline and midline where boys edged their counterparts in all subtasks.

A comparative analysis of RTS and non-RTS districts showed that RTS districts performed better than non-RTS districts in all major sub tasks. Table 1.1 summarizes comparative performance.

Table 1.1: RTS and Non-RTS EGRA Percentage Increase in Mean Scores						
EGRA Subtask	**Baseline**		**Endline**		**% Increase**	
	RTS	**Non-RTS**	**RTS**	**Non-RTS**	**RTS**	**Non-RTS**
Letter Sounds	2.96	3.63	13.95	8.5	371.28	134.16
Non-word reading	0.88	1.39	8.19	6.03	830.68	333.81
Reading fluency	1.15	2.02	10.44	8.08	807.83	300.00
Reading comprehension	0.08	0.13	0.85	0.79	962.50	507.69
Listening comprehension	1.51	1.85	6.61	3.56	337.75	92.43

When the percentage gains are plotted on a graph, a clearer picture emerges. See Figure 1.2 for details.

Figure 1.2: Graphic representation of performance in RTS and Non-RTS districts
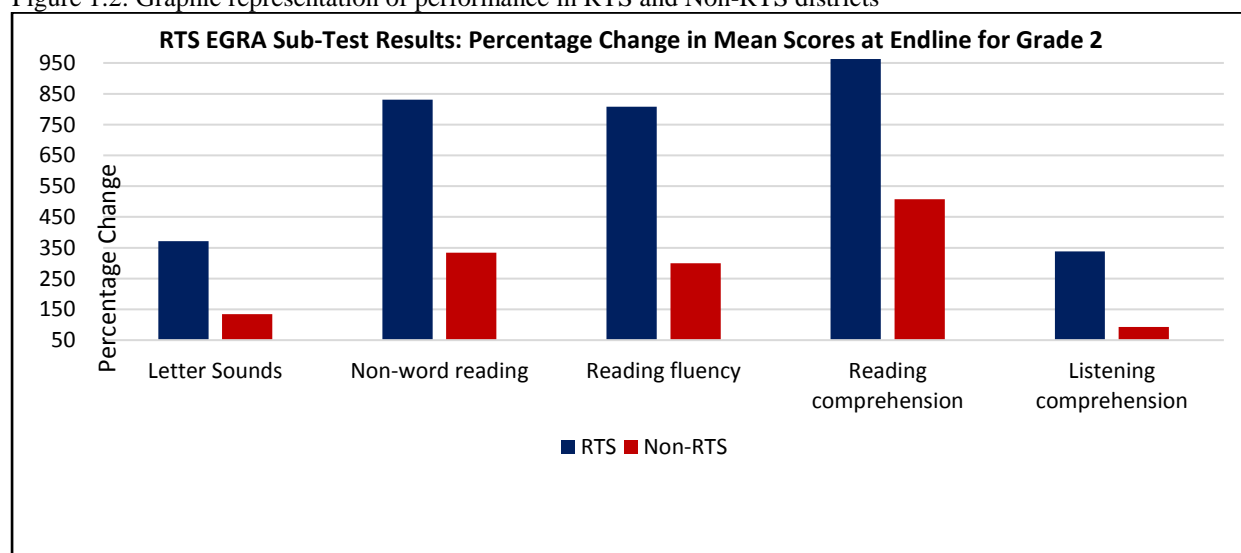
There were 80.3% of learners that said language of instruction was the same as the language they speak at home. The Endline Survey results indicated that learners whose home language is the same as language of instruction at school had slightly better scores (10.01 cwpm, 2.99 at baseline) in ORF than those that use a different language at home with a mean score of 9.77cwpm(1.13 at baseline). The performance was not statistically significant (P>0.05).

Teacher Performance: On teacher performance, the survey results showed improved performance on many pedagogical practices. For example, assessors observed that more teachers were resourceful and made teaching aids from local materials (88% up from 72.6% at baseline). Equally, teachers using active learning techniques in class improved from 64.7% at baseline to 83.4% at endline in all schools. It was also noted that more teachers conducted regular systematic assessments at endline as the score increased from 70.3% at baseline to 92.4%. During interviews, teachers indicated that they use assessment information to identify individual learner abilities and improve teaching and learning in their schools. In general, results show that there is positive behavior among teachers as they all exhibited desired pedagogical characteristics such as use of interactive teaching techniques and classroom organization where learners were mostly organized in small groups. Endline Survey results also indicated that there was increased support to teachers through Continuous Professional Development (CPD) which is carried out by head teachers and zone officials. Teachers also reported that more parents and members of the community were engaged (84.1% at baseline, 92.7% at endline) in learning activities thereby enforcing a culture of accountability among teachers and school management.

Head Teacher performance: Many head teachers (98%), exhibited a strong focus on promotion of early grade reading. They provide instructional leadership by ensuring that teachers develop teaching lesson plans by observing teachers (85.5% up from 29.6% at baseline) and by motivating teachers through positive feedback (71.5% up from 30.0% at baseline). Evidence also showed that there is substantial involvement and focus on promotion of effective reading by head teachers. For example, nearly all head teachers (99.5%) said that literacy is taught as a separate subject for an average period of 53 minutes. This represents a significant change from baseline, where only 25% indicated that literacy was taught as a separate subject. Further, results showed that head teachers were focused on ensuring quality teaching and learning while retaining administrative oversight. All head teachers said it is their responsibility to help teachers teach better in schools and they do it via open communication (78.0% up from 24.1% at baseline) and using their own knowledge (86.5% up from 19.4% at baseline). The collaboration with PTA and general community members was strengthened as evidenced by the increase from 7% to 17% at endline of head teachers reported having regular meetings with communities members. At baseline, only 31.5% of head teachers had received training for their current roles, but at endline, over three quarters (79.4%) said they had been trained in specific roles of leadership. All head teachers indicated that Teacher Group Meetings (TGMs) are a key feature of CPD at school and zone level resulting into strong CPD culture in many schools. Head teachers also reported that visits from district and provincial officials increased to 4 from an average of 2 visits (baseline value) per year, further supervision and monitoring of school activities.

MOGE Officials: Many district and provincial officials (91%) demonstrated understanding of how to teach reading in schools. They were aware that schools set aside time for teaching reading and they further confirmed that schools use official local languages as a medium of instruction for grades 1 and 2. In addition, most officials (74.4%) know that the common method of teaching reading in schools is sounding out letters and decode words as opposed to memorizing (11.6%) and reciting words (25.6%). They stated that the major challenge faced by schools with respect to teaching of reading is shortage of materials (86%) and poor teaching practices (39.5%). With regards to information and planning, more officials (86%) compared to 29% at baseline personally use information they gather from schools to monitor implementation of school plans. Opinions of officials regarding head teachers' attitude towards planning showed that 83.7% (45% at baseline) of all officials think that head teachers are willing to plan because they feel that their school can change for the better. External support from zone officials towards school monitoring was well noted by 95.3% (up from 69% at baseline) of district and provincial officials. They rated them as highly effective 18.6% (0% at baseline), quite effective 62.8% (53% at baseline) and partly effective 14% (41% at baseline). None was rated not effective 0% (6% at baseline). These results reflect a growing positive attitude among officials towards promotion of quality teaching and learning in schools.

Conclusion: The Endline Survey results demonstrated significant improvement in learner performance between 2012 and 2016. This conclusion was supported by a growing number of learners that have mastered basics in letter naming and letter sounds and the basics in reading fluency. With regards to school effectiveness, more teachers demonstrated desirable pedagogical practices such as lesson

planning, development of teaching aids, using interactive teaching techniques, conducting regular assessments and engaging with parents and community. In addition, head teachers provided close supervision of teachers particularly with respect to classroom observations. Zone officials were more active as they organized CPD meetings and visited individual schools more regularly to provide onsite coaching and mentorship. District and provincial officials provided regular support to schools leading to improving learner performance. Overall, the evidence shows improvements in many areas of school management with RTS districts recording better performance than non-RTS districts.

Despite the significant changes in performance that occurred between baseline and endline, there are still a lot of learners that fall short of required skills to read and comprehend grade level text. With only 14.6% (2.80% at Baseline) of grade two learners reading at the proposed government standard of 20 cwpm, this report concluded that even though progress has been recorded a lot more still needs to be done to achieve desired reading outcomes. To see real meaningful change in learner performance, more resources will be required for teacher training, material development and leadership transformation mentorship activities.

Recommendations:
1. There is need for increased investment in the production and distribution of reading materials
2. Support teachers to focus more on teaching comprehension
3. Increase use of assessment data to improve teaching and learning
4. School head teachers and officials should enforce homework policy at school level
5. Encourage more parental involvement in learners' academic processes
6. There is need to strengthen school-based coaching and support particularly through zonal officials.
7. Interventions that promote reading take longer to bear fruits. Therefore, future interventions should be designed for a longer implementation horizon to allow more time to assess impact of the initiative
8. Conduct more research on factors which affect effective teaching of reading

2.0. BACKGROUND

2.1. Introduction

There is sufficient evidence in international literature to demonstrate that reading is a foundation skill to other learning activities (Wolf, 2007). Children who fail to learn to read in the first few grades of school continue to struggle in later grades to learn increasing amounts of instructional content across all subject areas. Reading skills necessary to become "literate" do not develop naturally; learners have to learn to adapt the part of their brain that recognizes images to be able to recognize written letters and words (Wolf, 2007). Barrett (2015) observed that "learning has emerged as a central theme within post-2015 debates". She further stated that literacy was core to the efforts meant to improve learning.

As has been confirmed by researchers in reading acquisition in multiple alphabetic languages where print material can be decoded into sounds, learners need to acquire five basic reading skills to read well (National Reading Panel, 2000): The version of reading represented in the National Reading Panel report served as the foundation for the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) assessment (upon which EGRA is based), a continuous assessment classroom tool developed for use in the US that reduces reading to discrete skills and then condenses those skills to isolated, quantitative measures

- **Phonemic awareness**–ability to hear, identify and manipulate individual sounds in spoken words. It also deals with the ability to differentiate sounds(phonemes) through hearing
- **Phonics**–relationship between sounds and letters that make up words;
- **Fluency**– reading accurately, quickly and with expression;
- **Vocabulary**–Degree of knowledge of words (both oral and written) and their meaning; and
- **Comprehension**–understanding the concepts read or heard.

According to Roskos et al (2009), the first three reading development stages focus on foundation skills of learning to read. Once children learn to apply the foundational reading skills in early grades, they can then move beyond the task of decoding text to deriving meaning. In subsequent grades, children begin to derive meaning and develop understanding. As children learn sounds that link to form words, they begin connecting those sounds to printed words and the idea behind those words. Thereafter, they start to identify letter sounds, form syllables and words and link words to form sentences, paragraphs and read and write stories. It is at these crucial early stages that children transit from "*learning to read*" to "*reading to learn*". At grades 2-4 and beyond, comprehension is the ultimate prize! Fuchs *et al* (2001), assert that the critical strand in this process is oral reading fluency, as measured by the number of words read correctly per minute.

Following the Baseline Survey conducted in October 2012, RTS conducted a Midline Survey in October 2014 with a view to comparing learner performance for the two survey periods. Both surveys examined early grade reading skills for Grades 2 and 3 learners. In addition, surveys collected performance data from primary school teachers, head teachers, district MoGE officials and general school performance using overall school education statistics data. Results of the Midline Survey are important not only for project decision making but also for informing MoGE, donors and other relevant stakeholders about current reading performance and their implications for the education sector. In broader context, the report provides feedback regarding relative effectiveness of various instructional approaches introduced by MoGE/RTS with a view to identifying particular areas of need for further attention and investment by the MoGE and cooperating partners.

2.2. Read To Succeed Project Description

The RTS Project is funded by the United States President's Emergency Plan for AIDS Relief (PEPFAR) through the U.S. Agency for International Development (USAID) working in partnership with the Government of the Republic of Zambia (GRZ). The RTS Project is a five-year activity that aims to improve early grade reading through school effectiveness in Government primary schools in six provinces: Eastern, Luapula, Northern, North Western, Western and Muchinga. A meager learning environment, weak school management and leadership, and insufficiently skilled teachers has combined with the consequences of poverty and the HIV-AIDS pandemic to create an environment-at school and at home inimical to student learning and full participation in the classroom. According to SACMEQ[1], Zambia exhibited the lowest student achievement scores among the Southern African Development Community - SADC.

Map2.1: *Map of Zambia showing project intervention provinces*

RTS takes a "whole school, whole teacher, whole child" approach to ensure that government primary schools become centers of effective learning, care and support providing children with opportunities to learn and flourish. As noted in the background section, acquiring reading skills in early grades is critical to student performance in all subjects and therefore a catalyst for successful progressions through primary school, and promoting self-esteem. With the goal of improved reading outcomes, RTS works with Government counterparts to adapt and/or operationalize policies, enhance (or create) systems, and develop procedures to address key elements common to effective schools; learning, teaching, assessment, school management, parental participation, and support for children's holistic needs. Employing a phonics-based approach to teaching early grade reading in local languages, RTS develops teacher Continuous Professional Development (CPD) program and renders technical support to MoGE to develop materials for reading. RTS applies face-to-face cluster level training augmented by school-based activities and regular cluster meetings that resulted into training several staff members from one school as opposed to having single representation in training workshops. This approach is meant to ensure continuity even in the case of numerous transfers of trained teachers.

For effective and smooth implementation of activities, RTS worked closely with MoGE provincial and district personnel. RTS supported the MoGE in the development of reading and school effectiveness strategies and technical approaches and RTS trained MoGE provincial and district officials to actively engage in school support to improve reading and ensure accountability by all stakeholders especially teachers and parents. To increase learners' resilience against social pressures, guidance and counseling capacity in all schools were developed to help support girls and children made vulnerable by HIV/AIDS. Communities were engaged in provision of support and services to schools and children with a view to improving learning quality. The University of Zambia (UNZA) and Colleges of Education (COEs) located in target provinces worked with RTS on the research agenda developed with MoGE to analyze gaps and identify best practices for teaching reading for school effectiveness.

2.3. RTS Development Hypothesis

The RTS development hypothesis is: to increase student learning outcomes in reading, schools must be more effective in providing the services children need to learn. To do so, schools—and the system supporting them—must: strengthen instructional and management quality; use both student assessment techniques and data to monitor and adjust the teaching-learning process; and offer learners' support that

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[1] Southern Africa Consortium for Monitoring Education Quality (SACMEQ) is a regional think on matters of education. The group conduct surveys which assess education quality in SADC member countries

mitigates the impact of HIV-AIDS, socio-economic and gender inequities. Engaging local institutions in research and inquiry will produce information to feedback into continual improvements.

The following subsection provides a diagrammatic and relational summary of the RTS Project Results Framework (RF).

2.4. RTS Results Framework

The RTS Results Framework (RF) reflects this logic and depicts the causal relationships, congruent with the Mission's Results Framework for IR3.1.[2] The RTS RF, presented below, graphically depicts the project's results-based strategy for achieving the RTS Objective and Goal and contributing to USAID/Zambia's IR 3.1 and Development Objective 3.

The RTS Results Framework is organized on four levels: the RTS Objective, the RTS Goal, the Intermediate Results (IR), and Sub-Intermediate Results (SIR. The RTS RF provides the structure for its PMEP, the work plan, budget, project chart of accounts, and reports.

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[2] See "USAID/Zambia 2011-2015 CDCS Performance Management Plan, Development Objective 3: Human Capital Improved, Intermediate Result 3.1: Educational Achievement in Reading Improved (May 2012).

Figure 2.1: RTS Results Framework

Objective:	
Improved Educational Achievement in Reading in target provinces	

Goal:
Improved School Effectiveness in target districts in target provinces

IR 1: Decentralized education management practices to improve teacher accountability and sustain learner performance modelled

IR 2: Performance assessment tools and their use strengthened to improve school effectiveness

IR 3: School-based HIV-AIDS -Mitigating & Equity-Enhancing Student Support and services Improved

IR 4: Increased Engagement of Higher Education Institutions in Research to enhance evidence-based decision making

IR 1.1: Teacher Effectiveness CPD & accountability strengthened for improved reading skills

IR 2.1: Assessment policies, strategies & procedures to promote teaching reading strengthened

IR 3.1: School health policies & implementation framework harmonized

IR 4.1: Universities & other higher education institutions engaged in MoGE/RTS's research

IR 1.2: Head teacher and senior manager CPD & support program strengthened

IR 2.1: Assessment policies, strategies & procedures to promote teaching reading strengthened

IR 3.2: School Guidance & Counselling system operationalized

IR 4.2: Universities & college research network established

IR 1.3: School effectiveness improvement process in place in schools

IR 1.4: School effectiveness improvement process supported by districts

IR 2.3: Assessment data effectively used districts

IR 3.3: School Community Partnership to support school effectiveness strengthened

IR 4.3: Research internship program established

3.0.   METHODOLOGY

3.1.   Methodology Overview

This Chapter outlines the processes and mechanisms of how the survey was designed and conducted. Particular attention was paid to sampling design and data collection procedures. The major domains of data collection and analysis were zones, districts, provinces and an aggregate of six provinces. The other key domain was language, as it considerably influenced sampling design and development of data collection tools. It should be noted that the methodology designed at baseline is the same one used at endline. The data was collected from the same schools as those at baseline.

A representative sample of 4,000 children (2,000 grade 2 and 2,000 grade 3, i.e. 10 grade 2 and 10 grade 3 learners per school) was randomly selected from 200 schools across 16 districts (12 RTS and 4 non-RTS districts). The 4 non-RTS districts (control districts) were selected based on 4 local languages in which EGRA was conducted; that is, Icibemba, Chinyanja, Kiikaonde and Silozi. This is the reason why there are no 'control districts' for Luapula and Northern Provinces because Icibemba is spoken across the three provinces. Therefore, the choice of Mpika was representative for all Icibemba speaking provinces.

3.1.1.   Sampling Frame

The learners' target population for the RTS Midline Survey was grade 2 and 3 pupils enrolled in 200 Government primary schools in Eastern, Muchinga, Northern, Luapula, North-Western and Western provinces. The sampling frame was obtained from the MOGE Directorate of Planning and Information. The table below summarizes the sampling frame. This is the same sampling frame as the one used at baseline and midline.

Table 3.1: The RTS Endline Sampling Frame - No. of Schools from each District by Randomization Arm

Language	Province	Districts	Randomization Arm	# Schools
Icibemba	Northern	Mungwi	RTS	70
		Mporokoso	RTS	64
	Luapula	Mansa	RTS	134
		Mwense	RTS	60
	Muchinga	Chinsali	RTS	168
		Isoka	RTS	45
		Mpika	Non-RTS	115
	Sub total			**656**
Chinyanja	Eastern	Chipata	RTS	203
		Lundazi	RTS	148
		Katete	Non-RTS	94
	Sub total			**445**
Kiikaonde	North Western	Solwezi	RTS	118
		Mufumbwe	RTS	36
		Kasempa	Non-RTS	51
	Sub total			**205**
Silozi	Western	Mongu	RTS	104
		Sesheke	RTS	76
		Kaoma	Non-RTS	122
	Sub total			**310**
			Overall Total	**1,608**

3.1.2.   Sampling

The survey adopted stratified cluster random sampling technique. The schools were stratified by language and clustered by location (zone, district & province). The sampling procedure was done at two levels; (a) sampling zones and schools (*pre-survey*) and (b) sampling learners (*during survey*).

(A) Level 1: Sampling Zones and Schools (pre-survey)

In order to make logistics easy, the RTS survey coordination team decided to cluster schools by zone. This meant that once the zone was chosen, there was high probability of having more than one school in one zone, hence reducing on travel time and maximizing on quality interviewing. The zones were selected using simple random sampling from the sampling frame obtained from the MOGE. The number of zones was determined after computing the average number of schools per zone. Thereafter, the total number of schools in both intervention and control schools was used as reference for comparing with the average number per zone and then determined how many zones would be required to meet the number of schools selected for the survey. For example, if one (1) zone in Mungwi district has an average of 7 schools and number of schools required for the survey is 8, then 2 zones were adequate. Once the required number of zones was determined, then simple random sampling was used to pick the required number of zones using RANDBETWEEN Excel Function.

After choosing zones, the sampling frames were adjusted to only the list of schools that are in the selected zones. It should be noted that computations of schools per zone ratio showed an average number of 7 schools per zone across districts. Using the Mungwi example above, a sampling frame with 14 schools was enough to sample 7 schools. The 7 schools were chosen using simple random sampling.

As evident from Table 1, all RTS intervention districts were included in the sample but in Non-RTS districts (control districts) were purposively selected mainly because of easy access from the provincial capital and language representation as already mentioned above. Other factors considered were similar characteristics of education pattern of the district near the provincial capital for purposes of comparative analysis.

(B) Level 2: Sampling learners (during survey)

The sampling method used in Level 2 was systematic random sampling. Selection of learners was done at respective schools. Once the survey team arrived at the school and formalities were completed, the team leader asked for grades 2 and 3 class registers which were used for sampling actual learners that were tested during the survey. The interval (I) was calculated by dividing the total number of learners on register with the sample size (s) which is 10 for each grade. See illustration below:

$$I = \frac{\text{Total number of learners registered in grade}}{\text{Sample size}}$$

For example, if there were 60 learners registered in grade 2 and given the sample size of 10 learners per grade, then the equation above was substituted as follows;

$$I = 60/10 \text{ and the answer is 6.}$$

After calculating the interval, it was then used to systematically pick every '**I^{th} learner** on class register in that respective grade. In the example above, it is every 6th learner on class register, starting with child number 6 on register. To ensure gender balance, sampling took into account proportional representation for both girls and boys registered in each class so that neither was over nor under represented.

The following table summarizes EGRA sample size and response rate by language, province and district.

Table 3.2 : EGRA Sample Size & Response Rate

Language	Province	Districts	Randomization Arm	Target Schools	Actual schools	Target Pupils	Actual Pupils	Response Rate (%)
Icibemba	Northern	Mungwi	RTS	7	7	140	140	100.0
		Mporokoso	RTS	7	7	140	137	97.9
	Luapula	Mansa	RTS	8	8	160	160	100.0
		Mwense	RTS	5	5	100	100	100.0
	Muchinga	Chinsali	RTS	8	8	160	160	100.0
		Isoka	RTS	5	5	100	80	80.0
		Mpika	Non-RTS	10	9	200	187	93.5
	Sub total			**50**	**49**	**1000**	**964**	**96.4**
Chinyanja	Eastern	Chipata	RTS	20	20	400	397	99.3
		Lundazi	RTS	20	20	400	400	100.0
		Katete	Non-RTS	10	10	200	200	100.0
	Sub total			**50**	**50**	**1000**	**997**	**99.7**
Kiikaonde	N. Western	Solwezi	RTS	32	32	640	639	99.8
		Mufumbwe	RTS	8	8	160	160	100.0
		Kasempa	Non-RTS	10	10	200	194	97.0
	Sub total			**50**	**50**	**1000**	**993**	**99.3**
Silozi	Western	Mongu	RTS	24	24	480	480	100.0
		Sesheke	RTS	16	16	320	330	100.3
		Kaoma	Non-RTS	10	10	200	200	100.0
	Sub total			**50**	**50**	**1000**	**1010**	**101.0**
			Overall Total	**200**	**199**	**4000**	**3964**	**99.1**

Non EGRA Sampling

Apart from learners' sample for EGRA administration, the survey also included a non-random sample of 2 teachers that teach grades 2 &3 classes per school (targeted 400 teachers but captured 344 representing 86%). Teachers were first observed teaching a reading lesson and later interviewed on different aspects of pedagogical practices. The sample also included 200 head teachers. The head teachers were interviewed and then were also asked to provide school statistics on different issues (enrolments, dropout rates, pregnancies, progression rates etc.)

3.1.3. Training

Training was hands-on for all survey team members from day one; particularly that data collection was through android tablets that were loaded with Tangerine software. It should be noted that training in how to use tablets was done with the help of a technology expert from Creative HQ office in Washington. All 45 assessors from the University of Zambia and retired MoGE officials were oriented to project design which aimed to help them understand the project context. In addition, they were oriented to the survey purpose and objectives. This was important because it helped them understand their role in the survey. The training was hands-on and participatory in many ways. Facilitators organized the assessors in component groups *(i.e. EGRA assessors, classroom observation/teacher assessors & head teacher/school data assessors).* Each group went through its respective survey questionnaire(s) step-by-step on their tablet. After going through each questionnaire question-by-question, facilitators ensured that all assessors practiced through role plays within each group. The discussion and feedback from practice sessions helped assessors to reinforce understanding of the survey instruments and further helped them to re-align some questions which were not clear.

In order to ensure that only qualified assessors were selected, all assessors were tested and only those that scored over 70% were retained. Assessors were tested for knowledge of letter sound knowledge, instruments, ability to follow instructions, amount of errors committed, flexibility with tablets and including interpersonal skills with team members. Any assessor who did not pass the test was disqualified.

3.1.4. Pre-testing

As part of training, all assessors practiced using tablets in a real setting when they pre-tested at 9 government primary schools in Lusaka. Since there were 9 teams, each team went to one school and each assessor practiced using their respective questionnaire on the tablet in a real setting. Each team was accompanied by an RTS staff member, as observers of the process. Feedback from pre-tested questionnaires was used for the final questionnaire editing on tablets before teams were deployed to the field.

3.1.5.   Data Collection

Endline Data Collection Teams
Similar to baseline, RTS contracted independent assessors as data collectors. With a view to improving data quality and ensuring consistence, RTS retained and re-trained 64% of data collectors used at baseline. New team members were easily integrated into old teams. Data were collected simultaneously in all 16 districts. Fieldwork exercise began on October 10th and ended on 4th November 2016. RTS assembled nine (9) survey teams comprised of 5 persons each; 2 for EGRA testing, 2 for classroom observation/teacher interview and 1 for head teacher interview as well as school data.

Data Collection Tools
There were five sets of data collection tools for different target survey respondents. This was in line with RTS intervention approach which targets 'whole school', 'whole teacher' and 'whole child' with a goal to improve school effectiveness and learner performance. Data collection tools used at baseline were the same ones used at midline. Below are details of each tool:

(a) Early Grade Reading Assessment (EGRA)
The EGRA tool was administered by University of Zambia students in respective official local languages to grades 2 & 3 learners in all schools in the sample. The tool had eight sub-tasks on which learners were tested. The tasks were;

1. Orientation to Print
2. Letter sound knowledge (phonemic awareness)
3. Non-word decoding/reading (meaningless words)
4. Oral reading passage (reading fluency)
5. Reading comprehension
6. Listening comprehension
7. English vocabulary
8. English listening comprehension

(b) The Classroom Observation Tool & Teacher Interview and Performance Checklist
This tool was intended to capture actual action of how teachers taught reading lessons in schools. The focus of this tool was on observing classroom environment, classroom organization, instructional content, class activities, teaching methods, teacher's assessment of learners, teacher position while teaching and the overall observer's reflection of the reading lesson.

 To make one complete set, the same teacher whose reading lesson was observed was later interviewed by the same observer. Questions centered on classroom management, lesson planning, time on reading, reading knowledge, teaching methods, teaching aids, student assessment, continuous professional development, teacher monitoring and support and interaction with parents.

Head Teacher Interview Form & School Data
With the aim to capture issues on leadership, the survey interviewed head teachers on different aspects. Among them were: general pedagogical leadership, pedagogical leadership with a focus on reading, school management, guidance and counseling, Continuous Professional Development (CPD), parental/community support, and external monitoring support from provincial and district officials.

Related to the head teacher interview form was the School Data Form which collected data on general school information (state of infrastructure such as classrooms, toilets, furniture, adequacy of reading

materials, availability of electricity, running water etc.). Other key data were enrolments for academic years 2015/2016, teacher details and girls and OVC services provided at the school.

MoGE Officials Interview
This form captured data relevant for assessing provincial and district officials' support to schools. The targeted officials were:

- 1 SESO Languages (provincial), 1 Provincial Resource Centre Coordinator: Primary Schools
- 1 DEBS across RTS target districts
- 2 (District) Education Standards Officers: General Inspection (1 per intervention district)
- 2 District Resource Centre Coordinators: Primary Schools (1 per intervention district)

3.1.6. Data Quality Assurance (DQA)

In this survey, data quality assurance was embedded in the entire process from design to report writing to ensure rigorous methods and credible results. Since this was a repeat of baseline, the same data collection tools that were developed in close consultation with key stakeholders were used. The only adjustment was on the reading passage which was different at all three data collection intervals (baseline, midline and endline). The DQA had stages. First, MoGE officials and USAID partner projects like Time to Learn (TTL) Project provided input in reading passage development. Secondly, data collectors were all thoroughly trained for 5 days before sending them into the field. This ensured uniform understanding of the survey objectives and how to use the survey instruments. Third, the practical approach (role plays) on how to use data collection tablets during training and the pre-testing of all tools on tablets gave data collectors the feel of real practice of the assignment, thereby enshrining validity and reliability of results.

Fourth, in order to further re-enforce and ensure consistency of data quality, all team leaders were given a copy of survey guidelines. The guidelines provided details of all survey procedures including sampling at school level, reporting lines, daily feedback team meetings, coding, how to summarize qualitative observations and how to upload data and submit to the Tangerine system.

Fifth, all teams worked under the leadership of the RTS officials; either provincial team leaders and/or advisors based in Lusaka. All supervisors in the chain checked for consistency and quality of assessments for all data submitted.

Lastly, the M&E and Research Director was in touch with all survey team leaders on a daily basis to ensure a seamless process of data collection throughout the survey. The daily feedback meeting was essential because team leaders were given advice on what to do in real time thereby avoiding delay in survey implementation. At the end of data collection, the M&E and Research Director conducted a thorough review of all data submitted by each team. He checked for errors and completeness before approving the teams' payment.

Overall, the data quality control procedures were watertight and were made easier by the use of Tangerine electronic data collection software. It made data collection and review much easier and quick than before.

3.1.7. Data Processing & Analysis

As mentioned in the data quality assurance section above, all data were checked for correct coding and consistency before they were uploaded to the system. Data were downloaded from the Tangerine server in CSV format and later converted to regular Excel spreadsheet before transforming it into SPSS. Data was analyzed using a combination of software SPSS and MS Excel. Analysis was mainly descriptive i.e. mean, median, mode, range, standard deviation and related statistics. Statistical testing took the form of Chi-Square and T-Test. All statistical tests were important because they enabled the author to isolate variables' contribution and/or their association or relationship with each other.

3.1.8. Limitations

The Endline Survey results were not generalizable to the whole Zambia but only applicable to RTS districts. Further, non-RTS districts have also received partial interventions since MOGE rolled out the Primary Literacy Program to all schools in Zambia. Therefore, comparison between RTS and non-RTS districts should be done with this limitation in mind. The other important limitation is the fact that the EGRA test is not curriculum based which entails that learners were tested in something not taught in class, thereby increasing the probability of failure since the test was unfamiliar to them. It should be noted that learners tested in 2016 were different from those tested in 2012 and 2014 or that EGRA is not a longitudinal cohort study. Therefore, all learners took the EGRA test for the first time. In addition, this survey did not collect qualitative data which could have provided rich contextual explanations to support generated statistics.

4.0. FINDINGS AND DISCUSSION

4.1. Early Grade Reading Assessment (EGRA)

Headline Findings: EGRA

- Substantial reduction in zero scores in all EGRA sub-tasks. E.g. ORF reduced from 89% to 53.8%
- Progressive performance where Grade 3 learners had better scores than Grade 2. However, Grade 2 learners demonstrated more percentage gains between baseline and Endline e.g. In ORF, Grade 2 had a percentage change of 320% compared 211% for Grade 3
- Reading comprehension is the most difficult EGRA sub-task with zero scores at 68% for Grade 2 learners
- There is no advantage in using English as a medium of instruction as performance in Listening Comprehension in English had significantly lower scores than Listening Comprehension in Local Language (44.2% and 97.6% respectively)
- Performance in RTS districts was significantly better than in Non-RTS districts (10.44 vs 8.08 cwpm in ORF respectively)
- Silozi Language had more consist performance as performance improved from 2.54 to 11.53 cwpm in ORF
- Within the Icibemba speaking provinces, Northern had the strongest performance, ousting Luapula which had better scores at baseline and midline. The weakest performance was seen in Muchinga
- Girls had better performance at Endline as they reversed the trend from baseline and midline where boys dominated. They edged boys in all key EGRA sub-tasks like letter sound knowledge, non-word decoding, oral reading fluency and reading comprehension.

The RTS impact surveys (Midline and Endline) results showed that reading skills have improved in RTS supported schools across all EGRA sub tasks for both grades 2 and 3 learners in six provinces. Performance for grades 2 and 3 learners more than doubled over the life of the project For example, there were more grade 2 learners who got at least one correct word per minute from only 11% in 2012 to 46.2% in 2016 in the Oral Reading Fluency (ORF) EGRA subtask. The opposite of this statistic was the proportion of learners who got a zero score in ORF. For grade 3, the proportion of learners that obtained at least 1 correct word per minute increased from 20.3% in 2012 to 63.3% in 2016. The opposite is a zero score. This represents a percentage change of 320% and 212% for grades 2 and 3 respectively. See Table 4.1a and Table 4.1b for more details. Please note that Table 4.1b has details about learners with zero scores. It was noted that the proportion of learners scoring zero substantially reduced across all subtasks for both grades. For example, in ORF, zero scores reduced from 89% to 53.8% for grade 2 learners while for grade 3 learners, zero scores fell from 79.7% in 2012 to 36.7% in 2016. This is an indication that more learners mastered the fundamentals skills of reading. Figure 4.1 has more details. Results also showed that even though there was more improvement among grade 2 learners, their grade 3 counterparts still maintain higher scores overall. This is an indication that there is progression from one grade to the next.

Table 4.1a: Percentage of learners that obtained at least 1 correct mark across EGRA subtasks.

EGRA Subtasks	Grade 2			Grade 3			Both Grades		
	BL	ML	EL	BL	ML	EL	BL	ML	EL
Orientation to print (%)	72.5	87.3	88.9	77.1	89.8	94.4	74.8	88.6	91.6
Letter sound knowledge	38.1	71.7	79.6	51.3	73.5	84.1	44.7	72.6	81.8
Non word reading	10.0	39.8	47.4	19.8	50.8	64.5	14.9	45.3	55.9
Oral reading fluency	11.0	31.0	46.2	20.3	41.6	63.3	15.7	36.3	54.7
Reading comprehension	5.6	21.6	32.0	12.2	31.0	45.2	8.9	26.3	38.6
Listening comprehension	77.6	96.0	96.8	81.8	97.3	98.4	79.7	96.7	97.6
English vocabulary	74.9	99.6	99.8	74.4	99.6	99.9	74.7	99.6	99.8
English Listening comprehension	NA	27.6	39.0	NA	42.5	49.5	NA	35.1	44.2

Key: BL=Baseline, ML=Midline and EL=Endline

Table 4.1b: Percentage of learners with **zero scores**[3].

EGRA Subtasks	Grade 2			Grade 3			Both Grades		
	BL	ML	EL	BL	ML	EL	BL	ML	EL
Orientation to print	27.5	12.7	11.1	22.9	10.2	5.6	25.2	11.4	8.4
Letter sound knowledge	61.9	28.3	20.4	48.7	26.5	15.9	55.3	27.4	18.2
Non word reading	90.0	60.2	52.6	80.2	49.2	35.5	85.1	54.7	44.1
Oral reading fluency	89.0	69.0	53.8	79.7	58.4	36.7	84.3	63.7	45.3
Reading comprehension	94.4	78.4	68.0	87.8	69.0	54.8	91.9	73.7	61.4
Listening comprehension	22.4	4.0	3.2	18.2	2.7	1.6	20.3	3.3	2.4
English vocabulary	25.1	0.4	0.2	25.6	0.4	0.1	25.3	0.4	0.2
English Listening comprehension	NA	72.4	61.0	NA	57.5	50.5	NA	64.9	55.8

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[3] Figure 2 has better illustrative picture of zero score reductions

Figure 4.1: Zero Scores Reduction among grade 2 learners
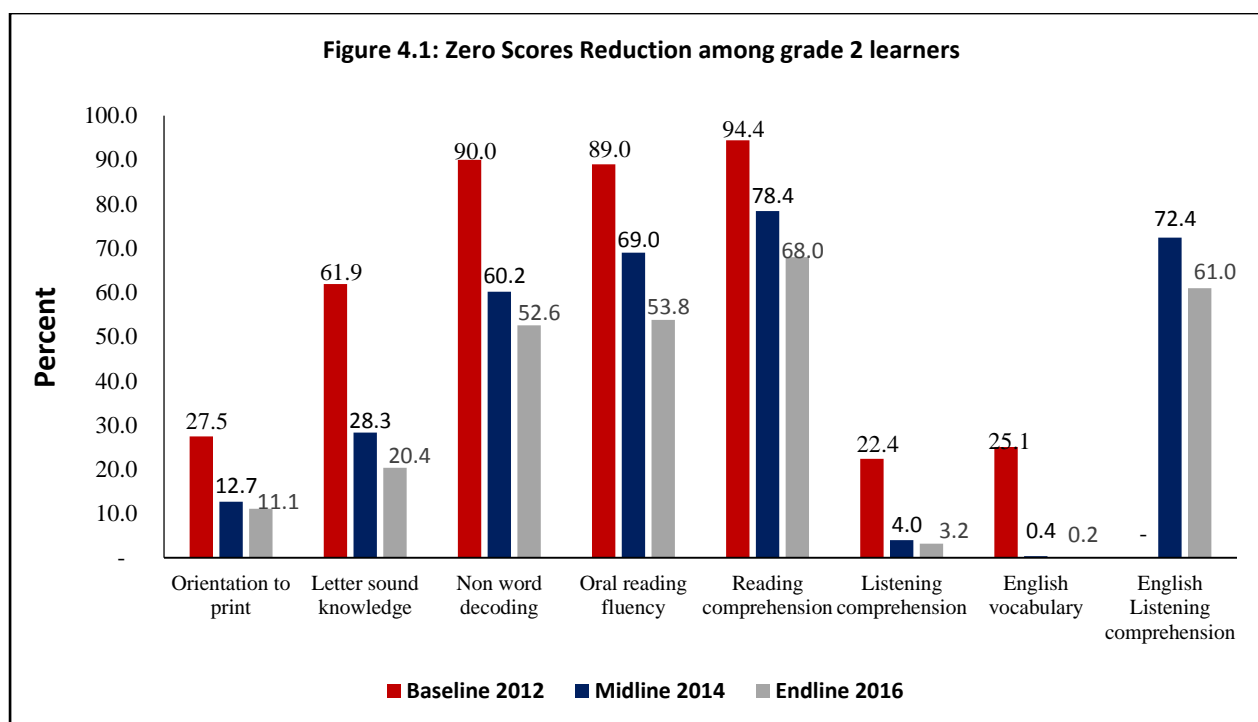
From Tables 4.1b, results showed that the most difficult tasks were non-word reading (90% at baseline but has dropped to 52.6%), oral reading fluency (89% at baseline but has dropped 53.8%) and reading comprehension (94.4% at baseline but has dropped to 68%). Reading comprehension is the single most difficult sub-task for all learners across survey periods. The pattern for the three sub-tasks has been consistent in all surveys, where the ORF and non-word reading subtasks have almost the same scores while reading comprehension scores were higher than the two (ORF and non-word reading). This pattern was true at baseline, midline and endline surveys.

Results also showed that listening comprehension (local language), English vocabulary and orientation to print did not pose many challenges to learners. For both grades, letter sound knowledge improved from 44.7% in 2012 to 81.8% in 2016. Further, results indicated a clear relationship that good letter sounds knowledge form the basis for improvements in other subtasks such as non-word reading, oral reading fluency and reading comprehension. A comparison of listening comprehension in local language and listening comprehension in English showed a wide disparity. At endline, learners performed better in local language listening comprehension (97.6%) than in English listening comprehension (44.2%). This result indicates that use of local languages as a medium of instruction is likely to produce better results than using English because learners showed better listening skills in local language than in English.

From another view point, results in Table 4 showed a similar trend in learners' performance where; reading comprehension, oral passage reading and non-word reading have the lowest mean scores. Once more, this pattern demonstrated that learners found these three subtasks more difficult to master. Just like at baseline and midline, endline results equally indicated that reading comprehension was particularly more problematic to learners than any other EGRA subtask. The results point to the fact that lack of sufficient practice in decoding skills leaves learners without proper orientation to read or decode new words.

Table 4.2: EGRA mean scores by grade

EGRA Subtasks	Grade 2			Grade 3			Both Grades		
	BL	ML	EL	BL	ML	EL	BL	ML	EL
Orientation to print (3)	1.85	2.36	2.49	2.07	2.47	2.7	1.96	2.42	2.59
Letter sound knowledge (100)	3.1	8.84	12.37	4.86	9.56	13.33	3.98	9.2	12.85
Non-word reading (100)	0.98	4.3	5.97	2.15	5.9	9.55	1.57	5.1	7.75
Oral reading fluency (32-56)[4]	1.32	5.67	7.41	2.99	8.85	12.54	2.16	7.26	9.96
Reading comprehension (5)	1.80%	8.80%	12.80%	4%	14.20%	20.80%	3%	11.60%	16.80%
Listening comprehension (5)	31.60%	60.80%	69.00%	35%	65.20%	75.00%	33.40%	63%	72%
English vocabulary (20)	5.91	7.96	7.53	6.27	8.8	8.56	6.09	8.38	8.05
English listening comprehension (5)	NA	12.00%	17.80%	NA	20.20%	25.20%	NA	16.20%	21.40%

Key: BL=Baseline, ML=Midline and EL=Endline

Table 4 indicates large percentage gains between baseline and endline. The highest gain was noted in reading comprehension (296.6%), followed by gains in oral reading 237%, non-word reading 225.9%, and letter sounds 131.2%. Analysis of percentage gains within each grade shows that improvement by grade 2 learners is higher than that of grade 3 learners. See Table 4 for details. The reason why grade two learners have shown more improvements than grade three may be due to the fact that RTS interventions started when they were in grade one. In this sense, they have received full package of all RTS interventions.

Table 4.3: Analysis of percentage changes

Selected EGRA Subtasks	% change in each grade between 2012 and 2016	
	Grade 2	Grade 3
Letter sound knowledge	299	174
Non-word reading	509	344
Oral reading fluency	461	319
Reading comprehension	673	420

In the context of national standards[5], the reading performance of about 10 correct words per minute still fall short of the minimum requirements of 25 and 40 correct words read per minute for grades 2 and 3 respectively. This means that despite substantial progress recorded over baseline scores, there is still a lot of work to do towards achieving and surpassing acceptable suggested minimum national standards. Increasing effort and refining strategies for better results should take center stage and maintain the momentum of generated results so far across all provinces. Given current results, it is reasonable to argue that while efforts towards for improving reading performance should double, expectations about learner achievements in the short-term should be moderate. This is because it will take time before learners can sufficiently demonstrate masterly of reading skills. To get leaners to the desired end, different approaches and/or techniques will be required.

As scholars and educationists continue to explore best ways of addressing illiteracy, some studies, for example, Roskos et al. 2009 showed that in third grade, friendships become extremely important, as children long to be part of a group. Skillful teachers should take advantage of learners' need for social interaction by planning small and large group work on longer and more complex projects. A struggling reader might pick up a new reading strategy from a more literate peer, but may also take pride in being the "master" artist that the group relies on. According to Roskos et al. 2009, stages of reading development - grades 1-3, *confirmation and fluency*, learners develop fluency in reading, recognize patterns in words, check for meaning and sense, and know the stock of sight words. At this stage, children are learning to read which later translate into better performance. MoGE will need to look

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[4] Numbers in brackets indicate the total out of which the test was marked. Oral reading passage has range 32-56 because each test language had its own total. i.e. Chinyanja (40), Icibemba (47), Kiikaonde (56) and Silozi (32) words

closely and evaluate pedagogical skills of teachers in schools so that they become more creative in their lesson delivery. Ultimately, the goal is to ensure that learning takes place and learners are progressing well in their academic career.

There is a close relationship between oral reading fluency and reading comprehension because fluency measures whether learners have the ability to read with enough speed and automaticity, so that they can concentrate on comprehension rather than sounding out every word. Learners who sound out each word use most of their working memory thinking about the sounds that letters make and then putting the sounds together. While learners who read fluently decode words automatically and can use their working memory to make meaning of what was read, reading fluency is necessary but not sufficient for comprehension; it is only one piece of the comprehension process (Roskos et al. 2009). To improve comprehension, letter sound knowledge, as a predictive skill for later reading success, should be emphasized more. Roskos et al. (2009) further contend that for successful management, this process requires the ability to work systematically, that is, moving from letter sounds to words ensuring that learners grasp the mechanics of identifying and blending words or sounds while at the same time understanding the process of separating (and manipulating) words into sentences. Fortunately, results of the three RTS surveys (Baseline, Midline and Endline) showed a logical progression from simple skills such as letter sounds knowledge to more complex tasks like decoding, fluency and comprehension. The results are an indication of a positive trajectory in performance. With more focused support towards reading initiatives, it is possible for MoGE to achieve steady and sustainable results in the long-term.

4.1.2. EGRA Analysis by language

Presentation of EGRA results by language is the most preferred approach because EGRA tests are language specific. This is because EGRA results are incomparable across languages. Therefore, scores of each language should be interpreted within the context of that particular language. RTI (2009) guided that the limitation on results comparison across languages arises due to variation in "orthographic complexity"[6]. In Zambia, languages like Silozi generally have shorter words compared to Icibemba, Chinyanja or Kiikaonde. Therefore, the structure of each language affects learners' ability to read differently. For example, the length of oral reading passages for all surveys were equally different with Icibemba having the most words of 60 words in the whole passage at Endline Survey. It was followed by Kiikaonde, Chinyanja and Silozi with 56, 54 and 52 words respectively.

During the course of the project, each language at least added 7 correct words per minute (cwpm) in ORF to the baseline figure, with Silozi having the most increment of 9 additional words. Chinyanja gained 8 more correct words than was the case at baseline. Icibemba and Kiikaonde had 8 and 7 more correct words than the baseline result. At baseline, none of the four languages had a score above 5 cwpm but at midline, all languages except Kiikaonde shot above 5 cwpm. Endline results showed that two languages (Silozi and Icibemba) had scores above 10 cwpm while Chinyanja is close to 10 and Kiikaonde trailing a few points below Chinyanja. Despite having the lowest mean score, Kiikaonde had a big increase between midline and endline. With regards to actual mean scores for all languages, Figure 4.2 has more details.

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[6] EDDATA II EGRA: Frequently Asked Questions http://pdf.usaid.gov/pdf_docs/Pnadr065.pdf, Access on 01.10.2017

Figure 4.2: Number of Correct words per mimute in ORF by Language
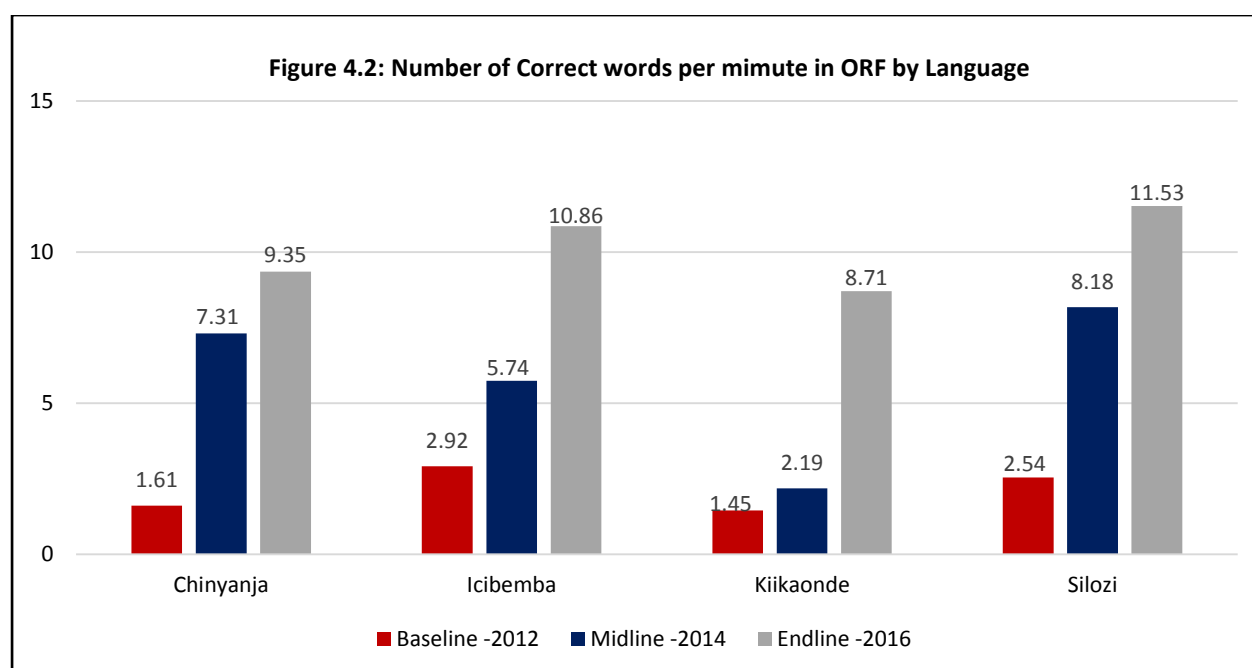
Results of other subtasks showed that Silozi language recorded significant improvements when endline and baseline figures were compared. For example, letter sounds knowledge improved from 2.34 Correct Letters Per Minute (CLPM) at baseline to 14.09 CLPM at endline. The reading and listening comprehension subtasks increased from 3.6% to 22.6% and 21% to 84.6% at baseline and endline respectively. Generally, there was a positive trajectory of performance in all the three surveys across all subtasks. Survey results also showed that there was a slight decline between midline and endline scores in English vocabulary for Chinyanja (8.96 to 8.2), Icibemba (7.97 to 7.62) and Kiikaonde (8.68 to 8.52) correct responses out a total of 20. Only Silozi had a higher score at 7.93 to 9.97 correct responses between midline and endline studies. With regard to English listening comprehension, only the Chinyanja language recorded a decline from 21.0% in 2014 to 17.6% in 2016. The other languages had positive scores. Table 4.4 has details of EGRA mean scores in each language for all subtasks.

Table 4.4: EGRA Mean Scores by Language from 2012 to 2016

EGRA Subtasks	Chinyanja			Icibemba			Kiikaonde			Silozi		
	BL	ML	EL	BL	ML	EL	BL	ML	EL	BL	ML	EL
Orientation to print (3)	1.91	2.56	2.47	2.26	2.22	2.55	2.64	2.59	2.64	1.01	2.3	2.79
Letter sound knowledge (100)	4.67	12.07	12.93	6.07	10.56	15.68	2.72	6.85	9.31	2.34	7.33	14.09
Non-word reading (100)	1.27	5.28	7.44	2.5	6.21	10.12	1.19	3.71	5.48	1.24	5.02	8.49
Oral reading fluency (32-56)	1.61	7.31	9.35	2.92	5.74	10.86	1.45	2.19	8.71	2.54	8.18	11.53
Reading comprehension (5)	1.4%	11.8%	18.6%	3.2%	8.0%	13.1%	2.6%	9.4%	12.9%	3.6%	16.8%	22.6%
Listening comprehension (5)	36.6%	64.6%	75.2%	40.2%	49.8%	57.5%	35.2%	69.0%	70.5%	21.0%	68.6%	84.6%
English vocabulary (20)	5.35	8.96	8.2	7.78	7.97	7.62	6.9	8.68	8.52	4.3	7.93	9.97
English listening comprehension (5)	N.A	21.0%	17.6%	N.A	16.8%	19.2%	N.A	17.8%	32.5%	N.A	8.6%	17.8%

Key: BL=Baseline, ML=Midline and EL=Endline

4.1.3. EGRA Analysis by province

It should be noted that the reason for results analysis by province is not to compare provinces that use different languages of instruction. It is meant to highlight salient performance issues among the provinces. This is particularly applicable to Luapula, Muchinga and Northern Provinces which share one local language for classroom instruction. Provincial performances show that Northern Province outperformed the other two Icibemba speaking provinces (Luapula and Muchinga). In Luapula, there was a slight decrease in performance and it was the only province with a reversed trend in performance.

Paradoxically, Luapula Province had a strong performance at baseline and midline. Within the Icibemba speaking region, the weakest province was Muchinga which increased performance from 2.37 CWPM to only 6.78 CWPM. The strongest performance in Icibemba speaking region was Northern Province which steadily and substantially increased from 2.42 to 15.74 CWPM. Figure 4 presents a summary of mean scores about CWPM in ORF for all provinces.

Figure 4.3: Number of Correct words per minute in ORF by Province
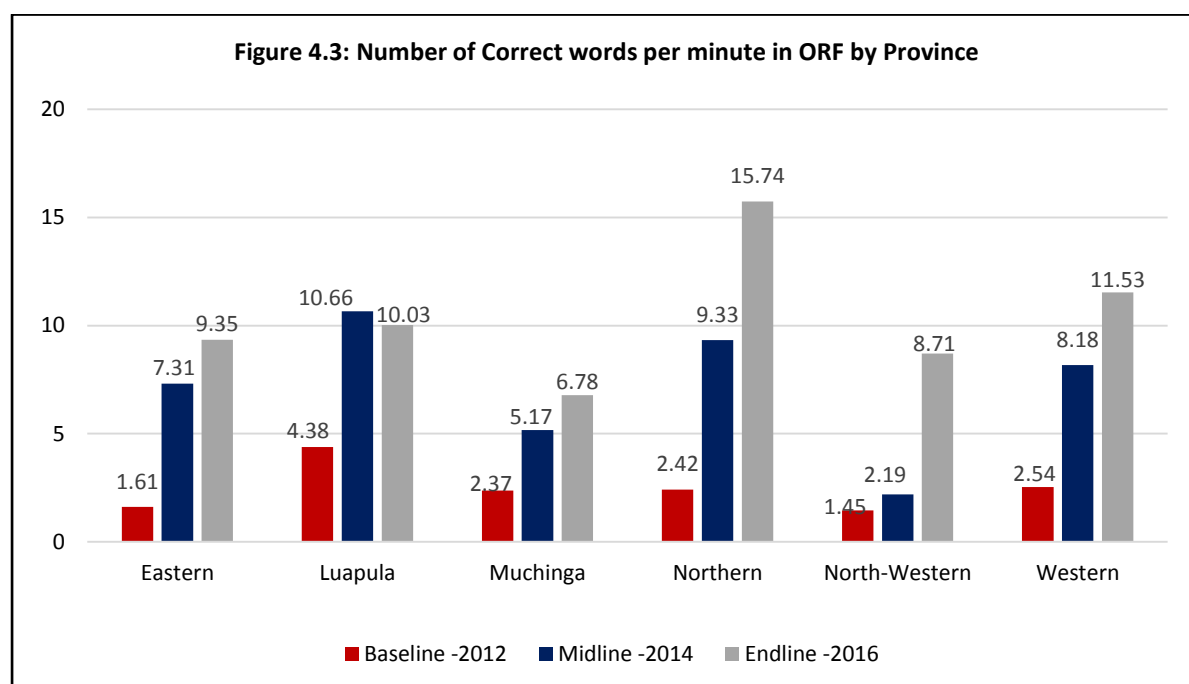
As noted above, Northern Province registered strong performance with high scores in five subtasks out of eight. The five subtasks were; letter sounds, non-word reading, oral reading fluency and reading. Other provinces with high scores were: North-Western Province in English listening comprehension, Western Province in listening comprehension, Western Province in reading comprehension and Luapula Province in English Vocabulary. Muchinga Province had low scores. Table 4.5 has more details.

Table 4.5: EGRA mean score by subtask and province

Province	Orientation to print			Letter Sounds			Non Word Reading			Oral Reading Fluency			Reading Comprehension			Listening Comprehension			English Vocabulary			English Listening Comprehension		
	BL	ML	EL	BL	ML	EL	BL	ML	EL	BL	ML	EL	BL	ML	EL	BL	ML	EL	BL	ML	EL	BL	ML	EL
Eastern	1.91	2.56	2.47	4.68	12.07	12.93	1.27	5.29	7.44	1.61	7.31	9.35	1.6%	11.8%	18.6%	36.6%	64.6%	75.2%	5.35	8.96	8.2	NA	21%	17.6%
Luapula	2.13	2.29	2.7	7.41	12.24	14.84	3.11	8.88	10.2	4.38	10.66	10.03	6%	12%	6.4%	38.4%	50.8%	56.6%	9.05	8.68	8.68	NA	28.8%	31.6%
Muchinga	2.29	1.99	2.14	5.52	9.12	11.87	2.33	4.54	7.19	2.37	5.17	6.78	2%	5.2%	9.8%	38%	50.8%	53.6%	6.98	7.55	7.13	NA	5.8%	14%
Northern	2.36	2.52	2.79	5.73	11.35	20.34	2.21	7.00	12.9	2.42	9.33	15.74	2.6%	9%	23.2%	45.6%	47.4%	62.6%	7.89	8.02	7.04	NA	23.8%	12.2%
N. Western	2.64	2.59	2.64	2.73	6.85	9.31	1.18	3.72	5.49	1.45	5.79	8.71	2.8%	9.4%	12.9%	35.2%	69%	70.5%	6.93	8.68	8.52	NA	17.8%	32.5%
Western	1.01	2.3	2.79	2.34	7.33	14.09	1.24	5.03	8.49	2.54	8.18	11.53	3.8%	16.8%	22.6%	21%	68.6%	84.6%	4.3	7.93	7.97	NA	8.6%	17.8%
Overall Mean	**2.06**	**2.38**	**2.59**	**4.74**	**9.83**	**13.90**	**1.89**	**5.74**	**8.63**	**2.46**	**7.74**	**10.36**	**3.13**	**10.70**	**15.58**	**35.80**	**58.53**	**67.18**	**6.75**	**8.30**	**7.92**	**NA**	**17.63**	**20.95**
Total Possible	**3**			**100**			**100**			**56**			**100%**			**100%**			**20**			**100%**		

Key: BL=Baseline, ML=Midline and EL=Endline

4.1.4. Analysis by subtasks

Subtask 1: Orientation to Print

This subtask was derived from Marie Clay's (1993) concepts about print assessments. The three items which consist of this subtask were: 1) where the learner would begin reading; 2) which direction the learner would read; 3) when the learner gets to the end of the line- where would s\he begin to read from. However, print awareness appears to have little ability to predict subsequent reading skills (Paris & Paris, 2006). In conformity to the preceding statement, endline results showed that the average score of correct responses increased to 2.59 (86.3%) from 1.96 (65.3%) at baseline. The Silozi language recorded the highest score (2.79) while the lowest was recorded by the Chinyanja language (2.47) correct responses out of the total of three. This subtask was not a problem for many learners. At midline, Kiikaonde and Icibemba had highest and lowest scores respectively. In this task, boys performed better than girls at 2.61 and 2.58 correct responses respectively.

Subtask 2: Letter Sound Knowledge

The letter sound subtask measures learners' ability to sound individual letters in their official language of instruction. Learners were tested whether they know specific letter sounds relevant for blending and syllable formations which result into word reading. It's the most basic skill that learners must acquire before they can move up the ladder to master skills like decoding, fluency and comprehension. As noted above, the highest and lowest average correct scores per minute were recorded in Icibemba (15.68) and Kiikaonde (9.31) languages respectively. The overall mean score of 13.90 letters sounded correctly per minute is an improvement from the baseline score of 3.95. The endline performance meets the minimum letter sound knowledge score of 10 alphabetic correct letters according to the Colorado Department of Education, Research and Evaluation (Hirsch, 2003). Sex disaggregation analysis showed that girls marginally out performed boys with 13.33 against 12.36 correct letters per minute. This is a reverse pattern because at baseline and endline, boys performed better than girls.

Subtask 3: Non-Word Reading

In this subtask, learners were examined on their ability to decode meaningless words. These were words they are not familiar with. Non-word reading, also called invented or meaningless/non-sense words, is a measure of decoding ability and is designed to avoid the problem of sight recognition of words. Many children in the early grade learn to memorize or recognize a broad range of "sight" words. Exhaustion of this sight-word vocabulary at around age 10 has been associated with the "4th grade slump"[7] in the United States (Hirsch, 2003). In Table 4.4, learners in Chinyanja speaking region decoded an average of 7.44 cwpm while their counterparts in Icibemba, Kiikaonde and Silozi decoded 10.12, 5.48 and 8.49 cwpm respectively. Across all languages, non-word reading substantially improved among learners. For example,   reading improved from 1.27 to 7.44 cwpm in Chinyanja. For Icibemba, reading improved from 2.5 to 10.12 cwpm while for Kiikaonde and Silozi, reading improved from 1.19 cwpm at baseline to 5.48 cwpm at endline and 1.24 at baseline to 8.49 cwpm at endline respectively. With respect to sex disaggregation, boys scored 7.5 cwpm compared to their female counterparts with an average score of 8 correct words per minute. At baseline and midline, boys had better scores than girls.

Subtask 4: Oral Reading Passage or Fluency

This subtask is a critical component of assessing literacy skills. Oral reading fluency is a measure of overall reading competency. It is the ability to translate letters into sounds, unify sounds into words, process connections, relate text to meaning, and make inferences to fill in missing information (Hasbrouck & Tindal, 2006). Because oral reading fluency captures this complex process, it is used as

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[7] "The "slump" was the name that the great reading researcher Jeanne Chall used to describe the apparently sudden drop-off between third and fourth grade in the reading scores of low-income students. In her research, Chall found that low-income students in the second and third grades tended to score at (and even above) national averages in reading tests and related measures such as spelling and word meaning. But at the fourth grade, low-income students' scores began a steady drop that grew steeper as the students moved into the higher grades", cited in Hirsch 2003, Reading Comprehension Requires Knowledge of Words and the World - *Scientific Insights into the Fourth-Grade Slump and the Nation's Stagnant Comprehension Scores*

a performance measurement yardstick for overall reading skills. From Table 5 above, the average performance of learners across four languages increased from 2.16 to 10.36 correct words per minute. The highest mean score was for Silozi (11.53) language followed by Icibemba (10.86), Chinyanja (9.35) and Kiikaonde (8.71). This was the same pattern of performance even at midline. With regards to sex disaggregation, girls performed better than boys with an average score of 10.36 correct words per minute compared to 9.56 for boys. At baseline and midline, boys had better scores than girls. The pattern had changed at endline.

In all languages, results showed better performance at endline and midline than at baseline. It was observed that differences between baseline and endline scores are substantial, but they still fall short of national and international standards. In their journal article, *Measuring Early Literacy Skills: A Latent Variable Investigation of the Phonological Awareness Literacy Screening for Preschool*, Townsend & Konold (2010) suggested that a child must read fast enough in English; at least 60 words per minute, or correctly answer 67 percent of the questions in order to understand the text. In Zambia, the 2014 MoGE guideline *(MoGE Reading Performance Level Descriptors (PLDs) for Grades 1-4. (2014) Pp 20 & 34)*, indicate that a grade two learner should be able to read an average of 25 correct words per minute across all languages. When this context is considered, the RTS endline results still showed a below average performance of expected national and international standards.

Subtask 5: Reading Comprehension
This subtask measures learners' ability to read and understand the story and be able to remember what they have read in the story. Learners were asked questions about the story and they gave responses by remembering what was in the story. In Table 6, the average mean score increased from 0.15 at baseline to 0.78 at endline out of possible total of 5 test questions. The result represents a percentage change of 413% between the two time periods. Equally, the percentage of learners who got a zero score reduced from 94.4% at baseline to 68% at endline. With regards to sex disaggregation, girls performed better than boys at 0.88 compared to 0.79 respectively. Again, the pattern of girls outperforming boys is not what it was at baseline and midline surveys. All surveys (baseline, midline and endline) results revealed that this was the most problematic subtask with zero scores of 94.4% at baseline and 78.41% at midline. The score improved at endline by dropping further to 68%.

Subtask 6: Listening Comprehension
For this subtask, assessors read out a short story to learners before asking them questions based on what they heard. This was purely a listening task. The listening comprehension subtask generally assesses a range of language and cognitive skills such as attention, vocabulary knowledge, comprehension strategies, processing of oral language and generation of appropriate replies. Results showed that many learners had high scores on this task, improving from an average score of 1.66 correct responses at baseline to 3.4 at endline. This represents a performance change of 105%. The overall performance by sex shows that boys scored a higher mean of 3.68 compared to 3.52 for girls. The number of learners without zero scores improved from 79.70% at baseline to 96.8% at endline. It means that the situation improved from desirable to outstanding performance level as prescribed in MoGE's Performance Level Descriptors (PLDs).

Subtask 7: English Vocabulary
The English vocabulary subtask measures learners' ability to understand basic English words and follow instructions. It is divided into three parts. The first part under English vocabulary involved learners showing body parts that were mentioned in English. The second part required learners to show items/objects that were mentioned by the assessor while performing psychomotor activities of placing items/objects following instructions spoken in English such as put the pencil; "on the paper; next to the paper; behind you; under the paper; in front of you; to the right of you."

In this task the average scores improved from 6.14 (Below Minimum) at baseline to 8.1 (Minimum) correct responses from a total of twenty possible marks. Even though the mean score is still below half, it should be noted that the number of learners without zero scores improved from 74.60% at baseline to 99.9% at endline. This result indicates that more learners are improving and grasping basic vocabulary skills relevant for their learning. Boys' performance was slightly higher than that of girls with average scores of 8.1 and 8.01 respectively. Such performance could be attributed to the nature of English words

selected. Naming body parts in English is common even among illiterate people. The second part utilized familiar objects such as pencil, shoes, desk, rubber and paper used by learners as they start school. Similarly, floor is a common word to learners because they are often told in English by the teachers to sweep the floor or to seat on the floor.

Subtask 8: English listening comprehension

This subtask was not tested at baseline but was included at midline following a request by MoGE through ECZ. Its inclusion is premised on the argument that some learners may perform poorly on listening comprehension subtask in local language because they use English at home. To compare learners' listening comprehension in local languages and English, MoGE advised that EGRA listening comprehension should be administered in both local and English languages. Like in Subtask 6, learners were assessed on their ability to attentively listen to a story read out in English by the assessor and generate appropriate responses to posed questions. Both the story and questions were read out aloud in English but the learner was free to respond in either English or their familiar local language. From the results, the average score was 0.80 correct responses at midline but improved to 1.07 at endline. This performance is much lower than 3.4 for listening comprehension in local language. In addition, English listening comprehension had more learners with zero scores (61%) compared to only 3.2% for listening comprehension in local languages. The wide gap between scores for the two subtasks may suggest that it is more advantageous to teach in local language than in English.

4.1.5. Analysis by RTS vs. Non-RTS districts

In order to compare results and see the impact of project interventions on learner performance, RTS collected data from non-RTS districts as well. A comparative analysis of reading performance between RTS and non-RTS schools was conducted. Even though results were disaggregated by RTS and non-RTS groups, readers should bear in mind that many RTS interventions already had a national spillover effect because some districts and provinces took initiative to implement RTS interventions in non-RTS target schools. Further, MoGE rolled out the Primary Literacy Program (PLP) to all primary schools in Zambia in 2014.

However, it must also be noted that intervention districts (RTS districts) received a full package of intended set of project activities which is not the case for non-RTS districts. The package is comprised of training (in PLP, local resource material development, education leadership and management, use of assessments, and guidance and counselling) and regular support visits necessary for on-site coaching and mentoring. Further RTS schools received supplementary reading materials in form of Reading Tools in a Box (RTB) which is not the case for non-RTS districts. Based on this assertion, intervention districts were expected to demonstrate better performance than non-RTS districts.

Therefore, interpretation of results should be done within this context so that outcomes are not over or under attributed to RTS activities. Notwithstanding survey contextual limitations, results indicated that RTS districts performed better than non-RTS districts in all subtasks. As presented in Figure 4.4, the RTS districts demonstrated stronger performance in three most important foundation subtasks: letter sounds, non-word reading and oral reading fluency.

Figure 4.4: Mean scores at Endline in RTS and Non-RTS districts
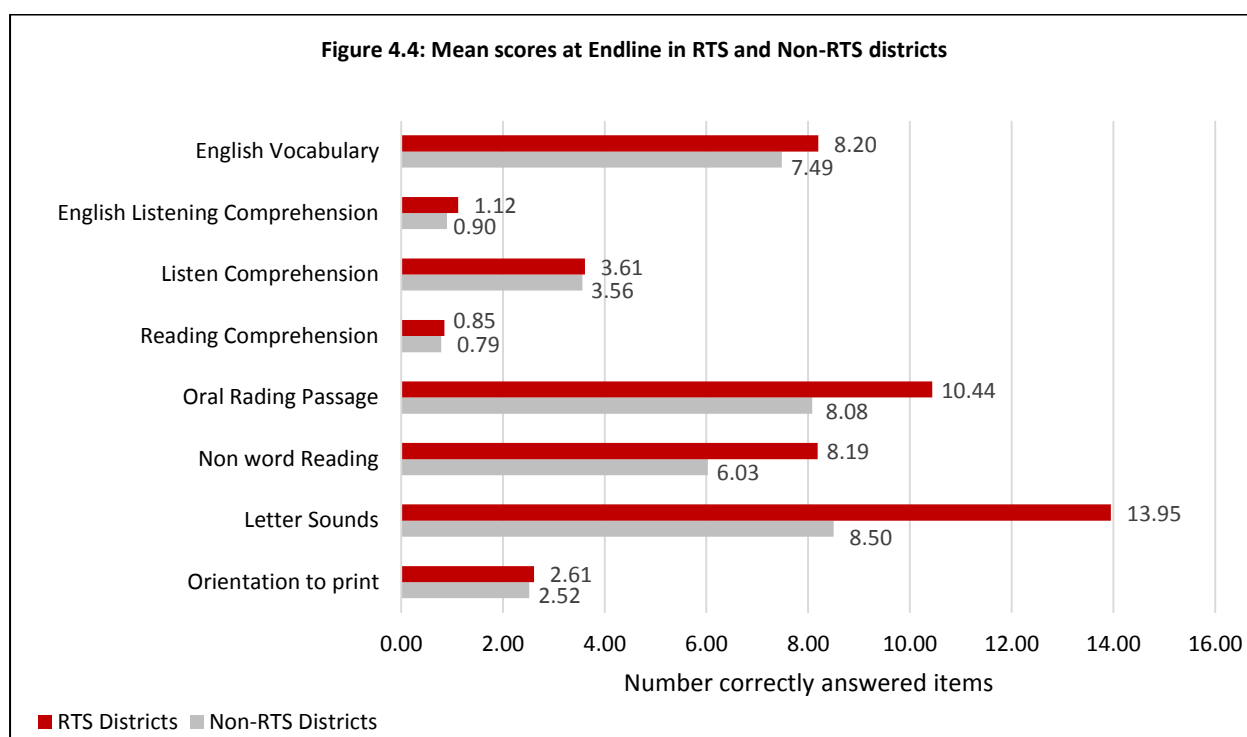
The above results were significant and were therefore an indirect demonstration of RTS's contribution to the positive changes observed in primary schools. A T-Test[8] of Independent Samples on oral reading fluency revealed that the mean differences were statistically significant[9]. Results showed that about 20% of all variations in learners' oral reading fluency ability can be explained by RTS interventions. Learners in RTS districts had a statistically significant advantage than those in non-RTS districts. Against this background, RTS interventions can be said to have had visible impact on learner performance in reading in its target schools.

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[8] A t-test is an analysis of mean samples for two populations through the use of statistical examination. It tests the difference between the samples when the variances of two normal distributions are not known

[9] t= -4.817, df=3961, P=.000 with effect size (Cohen's d) of 0.198.

4.2 Teacher Performance

Headline Findings: Teacher Performance

- Teachers' knowledge in how to teach reading increased from 81.2% at baseline to 87.8% at endline
- Teachers that help learners to pronounce letter sounds increased from 56.3% at baseline to 72.4% at endline
- Teachers that produce teaching and learning aids increased from 75.8% at baseline to 88% at endline
- Teachers that showed examples of self-made aids increased from 72.6% at baseline to 85.7% at endline
- Teachers correctly explained teacher-centered approach increased from 86.8% at baseline to 95.9% at endline
- Teachers that use active learning techniques increased from 64.7% at baseline to 83.4% at endline
- Teachers that listen to individual learners read aloud increased from 58.8% at baseline to 80% at endline
- Teacher that keep track of learner performance increased from 70.3% at baseline to 92.4% at endline
- Teachers that interact with parents increased from 84.1% at baseline to 92.7% at endline

Educationists agree that teachers make a big difference in the success of their learners. To do this, teachers must hold a fundamental belief that all children can learn to read and that they have the skills and determination to make it happen for their learners. Teachers should base their classroom practices on sound reading theory, they should provide instruction that meets specific learning needs of their learners, they should create a stimulating learning environment, and regularly assess their learners' reading achievement in relation to the expectations outlined in the curriculum. Overall, it is understood that "excellent reading teachers have strong content and pedagogical knowledge, manage classrooms so that there is a high rate of engagement, use strong motivation strategies that encourage independent learning, have high expectations for children's achievement, and help children who are having difficulty" (International Reading Association, 2000, p. 1)

For all impact surveys (baseline, midline and endline), teacher performance was evaluated in two parts: classroom observation of a literacy class in session and a one-on-one interview immediately after classroom observation. This approach was consistent with global literature, which emphasizes that the classroom context exerts influence over learner development and educational achievement arising from teachers' direct contact and instruction on a daily basis. The classroom context becomes most evident through aspects of teacher education and development, teacher characteristics and attitudes, classroom characteristics (for example, class size, and teacher-to-learner ratio), instructional materials and technology, instructional strategies and activities, and assessment practices *(Mullis et al. 2009)*. Therefore, the teacher has a significant impact on children's ability to learn not just in early grades but throughout their education process.

4.2.1 Teacher Demographic Information
In total, 344 teachers that took part in the survey. Out of this number, 234 were females and only 110 teachers were male representing only 32% as opposed to 68% for females. These proportions are different from the scenario at baseline where females accounted for 56.1% of the teacher population in RTS provinces. The above proportions are consistent with the 2015 (Education Management Information System (EMIS) Bulletin data which showed that there were more female teachers (54%)

in primary schools. The shift in proportional pattern at endline where the female teachers constitute almost two-third may be due to teacher transfers which are rampant in all provinces.

As for age, an average teacher is 34 years old compared to 33 and 31 years old at midline and baseline respectively. The youngest teacher was 22 while the oldest was 59 years old, up from 54 years baseline. The median age increased to 34 years from 32 and 31 at midline and baseline. The median age means that half of the teachers were aged 34 years and above. The mode age was 34 years, same as at midline but up from 30 years at baseline. The mode age means that the majority of teachers were aged 34 years at endline and midline but 30 years old at baseline. Results further showed that all teachers interviewed had been teaching for an average of 7.4 years compared to 6.4 years at midline and 5.2 years at baseline. This result demonstrated that there were more experienced teachers in schools. When broken down by province, Western had the longest serving teacher, with an average of 8.5 years while Muchinga had the lowest average of 5.3 years. Nearly nine in ten teachers were college graduates (89.5%). Teachers with secondary teachers' diploma and university qualification constituted 6.3% and 0.6% respectively. Teachers grouped in the *other* qualification (3.7%) were largely untrained teachers and/or volunteers.

4.2.2 Classroom Environment

The average attendance in all classes observed was 19 girls and 17 boys against an average registered number of 27 boys and 28 girls, with largest class having 97 learners on the register. This gives an average absenteeism rate of 32% girls and 37% boys. These rates are higher than those computed from the RTS routine monitoring data ranging between 25-30% absenteeism. Going by the numbers above, the average class size for observed classes was 36 plus 19 learners that were absent on the day of the assessment, giving a total class size of 55 learners. This is above the MoGE recommended teacher-pupil ratio of 1:40.

Overall, results showed that the classroom environment is more conducive than before the project started in 2012. For example, 100% of all classrooms had a chalkboard compared to 97.8% recorded at baseline. In addition, the results showed notable improvements in learners' ability to see what was written on the chalkboard as the scores increased from 83% at baseline to 96% at endline. Improvements were also noted in learners' ability to clearly hear what the teacher was saying in class as the result increased from 84.7% to 97% at baseline and endline respectively. Table 7 has a summary of the details.

Table 4.6: Summary Observations on Classroom Environment

Characteristics	Baseline %	Endline %
Availability of chalkboard	97.8	100
Learners can see what is written on the chalkboard clearly	83.0	96
Student can hear clearly what the teacher says	84.7	97

Owing to improved teachers' ability to produce teaching and learning aids from local materials, there were notable improvements in this aspect. At baseline, 75.8% of learners had access to exercise books/slates and 68.2% had pens/pencils while at endline, 88% and 89.5% of learners had books and pencils respectively. On the other hand, there was no change in the proportion of teachers that display teaching and learning aids in classes as the score remained the same (54%) for both at baseline and endline. Of all teaching and learning aids observed during the survey, 53% were considered appropriate by assessors compared to a baseline value of 47.9%. There was a steady decline on the proportion of classrooms where learners' work was displayed, from 28.3% at baseline to 14.7% at midline and to 11.8% at endline. Reasons for this drop were unclear but one probable factor is that classes may not display learners' work due to the fact that classrooms are shared with other grades. Further, at the time of the survey, schools were conducting examinations for grades 7, 9 and 12. During examinations, classrooms are cleared of all non-examination materials.

4.2.3 Classroom Organization & Management

The data showed an uneven pattern regarding teachers' practices with respect to classroom organization and management. Endline results showed that 60% of teachers practiced whole class[10] compared to 58% at baseline and 48.2% at midline. Teachers that organize learners in small groups during class was at 73.8% at baseline but dropped to 18.6% at midline and rose to 27.6% at endline. Equally, the proportion of teachers that pair learners during lessons rose from 10% at baseline to 33.2% at midline abut dropped to 12.6% at endline. Figure 4.5 has more
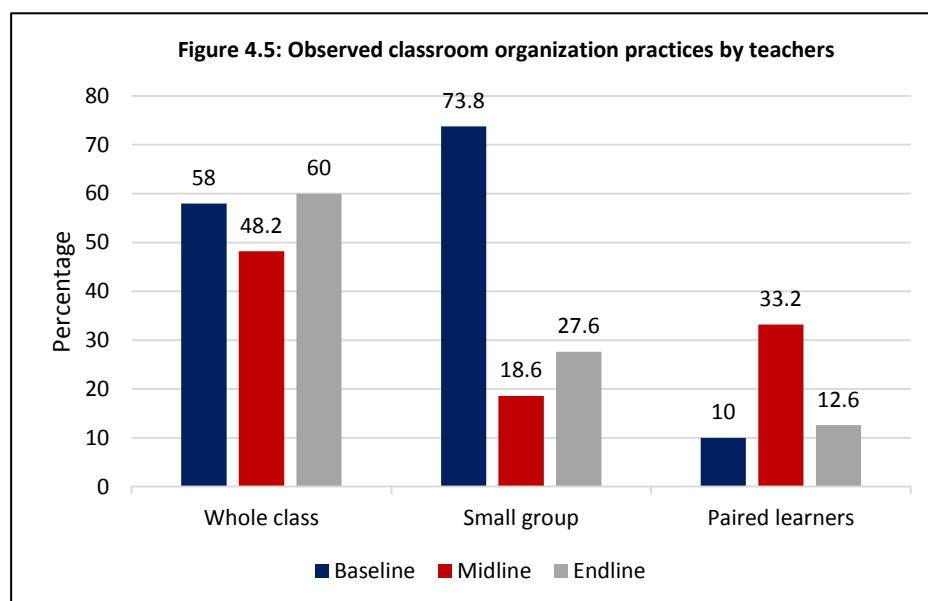

Figure 4.5: Observed classroom organization practices by teachers

details. The uneven pattern observed in the graph may be due to policy changes. For example, Primary Reading Program (PRP) emphasized on grouping learners according to their learning ability. However, Primary Literacy Program (PLP) discourages ability grouping. In 2016, the MoGE also worked with partners like Poverty Action Lab and VVOB[11] to promote 'Differentiated Learning' in Eastern and Southern Provinces. Given that teachers in lower primary teach multiple grades, some teachers who are exposed to this pilot project might have been confused which approach to follow. Therefore some teachers were not sure what to report to the assessors for fear of being perceived as using a wrong approach. This result may indicate the impact of policy inconsistences on the teaching and learning environment. With regards to discipline in class, 65.9% of teachers said discussing the issue with learner is the best way to solve the problem while 20.4% said punishment is the solution and further 1.2% was for the view that corporal punishment was the answer.

4.2.4 Instructional Content

There is evidence indicating improved instructional practices. Survey assessors observed that teachers' practices with respect to instructional content changed significantly as reflected in Table 4.7. Teachers are putting more emphasis on guiding learners on how to identify differences and similarities of sounds (63.8%), up from 42.6% at baseline. Other related tasks with high scores were pronouncing letter sounds which increased from 56.3% to 72.4% while blending letters improved from 41.1% to 61.5% at baseline and endline respectively. The only aspect which was least covered by teachers as part of their instructional content was speaking about their own lives. This was almost unchanged at 16.8 (baseline) and 16.2% (endline)

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[10] **Whole class** - whole class refers to when learners are not classified according to ability groups or pace groups in a class and are taught same content as a whole class without considering their levels of ability. For example, in PRP learners were taught different content in groups in the teaching corner according to their ability or level of progress based on assessment results at red, yellow or green - pace groups. **Small group** - This is when learners are placed in groups of 3 or 5 or 8 to discuss and do an activity during a lesson. Usually, there is a secretary and chair in the group. The secretary presents the groups work to the whole class. It is a strategy for teaching so as to enable all children to participate in a lesson by allowing them to work in small groups. **Paired learners** - This is when learners work in pairs to discuss or do an activity given by a teacher. It could be reading or writing or discussing a question in twos. It is also a strategy for focused teaching used by a teacher during a lesson. In summary, within whole class teaching, the teacher could also apply small group or paired learning. But pace grouping is not whole class teaching, is teaching according to the level or abilities of learners.

[11] Flemish Association for Development Cooperation and Technical Assistance (*VVOB)*

Table 4.7: Teacher Practices on Instructional Content

Instructional Content Description	Observed practices (%)	
	Baseline	Endline
Teacher guides learners to Identify differences and similarities of sounds	42.6	63.8
Teacher guides learners to Pronounce sounds of letters	56.3	72.4
Teacher guides learners to Write letters	46.0	58.8
Teacher guides learners to Associate words with letters	52.6	70.3
Teacher guides learners to Discuss meaning of vocabulary words	41.1	61.5
Teacher guides learners to Blend letter-sounds to form syllables and words	41.5	68.5
Teacher guides learners to Read sentences	56.3	81.5
Teacher guides learners to Read printed material or book	45.1	58.8
Teacher guides learners to Answer questions or draw picture about meaning of text	47.2	59.1
Teacher guides learners to Write words or sentences as dictated	31.4	54.1
Teacher guides learners to Create or write own texts (sentence or story)	19.1	32.6
Teacher guides learners to Speak about own lives, events or stories	16.8	16.2

4.2.5 Time on Reading and Reading Knowledge

Compared to baseline, endline results showed that 94.5% (90.5% at baseline) of all teachers have scheduled time for teaching reading which lasts between 30-90 minutes per session depending on the topic being covered. The majority of teachers (73.5%) reported that a reading lesson usually lasts for 60 minutes. Further, most teachers (86%) stick to their schedule of teaching reading and 83% of them said they teach reading everyday compared to 56.1% at baseline. There were about 65% of teachers that developed schemes of work but only 57% produced proof. For those who did not have scheme of work, some of the reasons given were that it takes too much time to prepare (1.5%) while others said they were not given a lesson plan template (2.6%) and some said they do not know how to prepare a plan (2,6%). Some teachers said they don't need it (6.7%). Generally, results indicate that there is sufficient time allocated for reading activities in schools but, also suggests that there was a considerable number of teachers who don't adequately prepare for lessons.

Regarding teachers' specific knowledge in how to teach sounds, there was no change in knowledge levels about recognition of letter names *(Ee)* as both baseline and endline value was 89.5%. However, their knowledge in letter sounds for letters *Ee* increased from 81.2% at baseline to 87.8% at endline. This result still show that letter names recognition knowledge is higher than letter sound knowledge. Teachers' performance on identifying letter names and sounds for *sh* and *mb* letter cards was 91.1% (baseline), 91% (endline) and 75.7% (baseline), 89.2% at (endline) respectively. The results demonstrates stagnated performance with respect to sound; *sh* but *mb* sound showed improvement. When asked why teachers should teach sounds to learners, results show an increase from 89.7% at baseline to 98.5% at endline of teachers who said that it was important because children need to learn how to sound and/or decode letters in order for them to read words. There were more teachers (99.1%) at endline who had heard about teacher-centered approach compared to 86.4% at baseline. At baseline 86.8% correctly explained what the teacher-centered approach was compared to 95.9% at the endline. Overall, results between surveys indicates a positive trend concerning teachers' knowledge levels of teaching reading and allocating sufficient time for reading.

4.2.6 Class Activities

With regard to classroom activities, assessors observed more positive behavior at endline than at the start of the project. For example, out of 10 observed classroom activities, only three showed a downward drift at endline. For example, learner recitation activities in class improved from 66.2% to 85.3%, listening to teacher reading aloud improved from 82.8% to 88.5% and answering teacher's questions improved from 79.7% to 95.9% at baseline and endline surveys respectively. Table 4.8 has more details. The observed classroom activities reflect an interactive engagement approach between the teacher and learners in the teaching learning process. The results are also in line with improvements observed instructional content and teachers' reading knowledge.

Table 4.8: Observed classroom activities (%)

Description of class activity	Baseline	Endline
Most learners are Listening to teacher read out loud	82.8	88.5
Most learners are Reading out loud together (choral reading)	69.6	85.3
Most learners are Reading out loud to another student (paired reading)	20.2	18.8
Most learners are Reading independently (by him/herself)	43.2	60.3
Most learners are Repeating/Recitation	66.2	85.3
Most learners are Answering teacher's questions	79.7	95.9
Most learners are Writing on blackboard (by learners)	50.4	62.6
Most learners are Writing on paper, in exercise book or slate (by learners)	70.3	92.9
Most learners are Working on group projects (by learners)	23.7	15.3
Most learners are Playing learning games, sketches or songs organized by teacher	31.3	24.4

4.2.7 Teaching Methods

Teachers were assessed on their ability to effectively engage learners using a variety of teaching techniques such introducing a lesson, engaging learners, writing on the board, how a lesson is concluded and other aspects of quality teaching. Overall, and as shown in Table 10, there were improvements about teaching methods when baseline and endline performance were compared. For example, results of observed practices indicate that teachers improved their performance regarding the way they introduce lessons to learners from (84.8% at baseline to 93.8% at endline. Equally, more teachers (85.9%) at endline demonstrated reading and writing skills compared to 69% at baseline. During classroom observations, assessors' records showed that teachers' criticism of learners went down from 16.2% to 5.3% and the proportion of teachers beating up learners during class sessions reduced from 10.7% at baseline to 1.2% at endline. Based on these results, it is fair to state that teaching methods have improved in RTS target schools.

Table 4.9: Observed teaching methods (%)

Teacher…	Baseline	Midline	Trend
Introduces lesson by explaining what learners will learn	84.8	93.8	↑
Conducts lesson in local language	84.8	98.8	↑
Reads aloud to learners	82.5	89.4	↑
Demonstrates reading or writing skills	69.0	85.9	↑
Responds to learner questions	33.0	33.2	−
Provides explanation if learner(s) don't understand	68.8	85.3	↑
Gives classwork for learners to practice	81.6	96.2	↑
Concludes lesson with summary of what was learned	62.5	84.7	↑
Praises or compliments learners	75.1	90.9	↑
Criticizes, scolds or punishes learners	16.2	5.3	↓
Beats learners	10.7	1.2	↓

Table 4.10: How do you get children to manipulate letters of the alphabet?

Manipulation Type	Baseline	Endline
Arrange letter or word tiles	26.5%	28.6%
Write letter to match sounds	31.4%	64.7%
Play word-sound games	15.6%	24.5%
Rhyme	12.1%	14.9%
Other	14.3%	14.0%

Teachers have shown improvements in their teaching methods. Actual classroom teaching methods have resulted into positive changes in teaching methods such as reading out stories to learners, listening to learners read stories, frequency of teaching reading. For example, 80.6% of teachers at baseline said that they read stories to learners daily and weekly compared to 91.2% at endline. Table 12 also sheds more light about improving teaching techniques. From the table, the least method used by teachers to get learners to manipulate letters of the alphabet was rhyming. Further, 88.7% of teachers at endline compared to 55% at baseline said they ask learners to read aloud stories in class on a daily basis. The results also show that teaching reading is a daily occurrence, improving from 42% at baseline to 72.9% at endline.

The commonest approach or method of teaching reading was sounding out words 49.9% up from 34% at baseline, followed by paired reading which improved from 18.6% at baseline to 30% at endline. In third ranking is reciting words, which dropped from 19.4% at baseline to only 7.9% at endline. This is a desired practice because teaching learners to recite words is not effective. Equally, teaching learners

to memorize words ranked the least on method of teaching reading and it dropped from 5.6% at baseline to 2.6% at endline. Almost three quarters (71.4%) of teachers know that a learner is having trouble with reading if that learner cannot sound out words or string words into sentences. This is improvement from 25.3% at baseline. According to teachers, the remedy for the children having trouble reading lies in giving extra assignments (78.7% up from 37.4% at baseline), work with the learner one-on-one (75.2% up from 33.9% at baseline) and to pair them with a good learner (38.2% up from 13.0% at baseline). When asked about using active learning technique, 83.4% at endline versus 64.7% at baseline of teachers reported that they use this technique frequently. Of the teachers that use active learning techniques, 87.2% at endline compared to 73.8% at baseline clearly explained what active learning techniques were.

4.2.8 Assessment Practices

The 2008 National Assessment Survey Report showed that learners in classes where teachers used various methods of assessing learners during lessons, such as field work, project, demonstration, discussion, games, role plays, drama and research tended to perform better in English and Life skills.

The Endline Survey results showed an improvement in teacher assessment practices over life of the project. Assessment methods include; asking learners questions about lessons 95.3% up from 81.5% at baseline, listening to individual learners read aloud 80% up from 58.8% and by using a reading assessment tool at 30% from 23.4% at baseline. This result indicates that more teachers are adopting use of formal and verifiable school based assessments tools relevant for strategic decision making. See Table 4.11 has the details.

Table 4.11: Observed assessment practice in class (%)

Teacher assesses learners by…	Baseline	Endline	Trend
Asking questions during lessons	81.5	95.3	↑
Monitoring learners as they work to check understanding	75.8	89.4	↑
Observing learner activities	69.7	86.5	↑
Listening to individual learners read aloud	58.8	80	↑
Using a reading assessment tool	23.4	30	↑
Giving quiz or tests	17.8	17.9	−

There was evidence that teachers conduct systematic assessments and keep track of learners' progress in learning to read with a view to improving learning outcomes. At baseline, 70.3% teachers said they keep track of learners' performance while at endline, the figure rose to 92.4%. Teachers who fail to keep records said there is too much work overload especially where the class was too large as it takes a lot of time to mark. Some teachers noted absenteeism as a key factor in administering assessment. Thus, where absenteeism is high, teachers fail to conduct assessments because many learners would miss out. One teacher said it was not necessary to keep records. When asked if the school had a learner performance assessment plan, 74.1% of teachers at endline compared to 42.3% at baseline said 'yes' and 63.3% of them compared to 40.8% at baseline correctly described it. On average, 97.1% of teachers use proficiency levels[12] to classify learners' performance. This was an improvement from 65.7% at midline when this system of assessment results classification was introduced. This results showed a good uptake by the teachers. Collectively, 54.2% at endline compared to 32.5% at midline of all teachers were for the view that their learners perform below minimum standards. As the results showed, there are less numbers of learners falling below minimum category. In general, it was noted that there were improvements in the manner teachers conduct school-based assessments and that there is a shift towards evidence based planning and lesson implementation using assessment data.

4.2.9 Teaching and Learning Materials

The survey results showed that the top three most common available teaching and learning materials were; flask cards 80.2%, posters/charts/pictures 74.3%, and chalk board (72.6% down from 90.6% at baseline). On the other hand, the three scarcest teaching and learning resources were;

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[12] Below Minimum 0-39%, Minimum 40-59%, Desirable 60-79% and Outstanding 80-100%. These Proficiency Levels (PLs) are defined in the Performance Learner Descriptors (PLDs)

audio/video/computer materials 0.9% (1.6% at baseline), worksheets 19.2% (16.1% at baseline), and also manipulative or real objects at 21% (24.8% at baseline).

The proportion of teachers who showed examples of self-made aides increased from 72.6% at baseline to 85.7% at endline. Among all aids produced, the bulk of them were flash cards (82.9%), followed by posters/charts at 73.7%. The increase in the proportion of teachers making teaching aids may due to RTS's efforts which promoted use of locally available materials to develop teaching and learning aids. Some teachers indicated that they do not prepare teaching aids because of the following reasons: lack of materials, there were already enough materials at the school, it takes too much time to develop materials and some teachers said they didn't know how to make own aids.

4.2.10 Teacher Position

Teacher position and movement in class is cardinal for capturing learners' attention and ensuring that learning takes place. Endline results showed that there were less numbers of teachers (55.9%) who just sit or stand in front of the class while teaching compared to 85.6% at baseline. The downward trend is a positive change as effective teachers are expected to move around in the class so that they can observe what learners are doing and help struggling learners. Overall, many observed aspects about the teacher during class showed a desired trend except not paying attention to learners which was unchanged with a somewhat slight increase. See Figure 4.6 below for details.


Figure 4.6: Teacher position in class while teaching
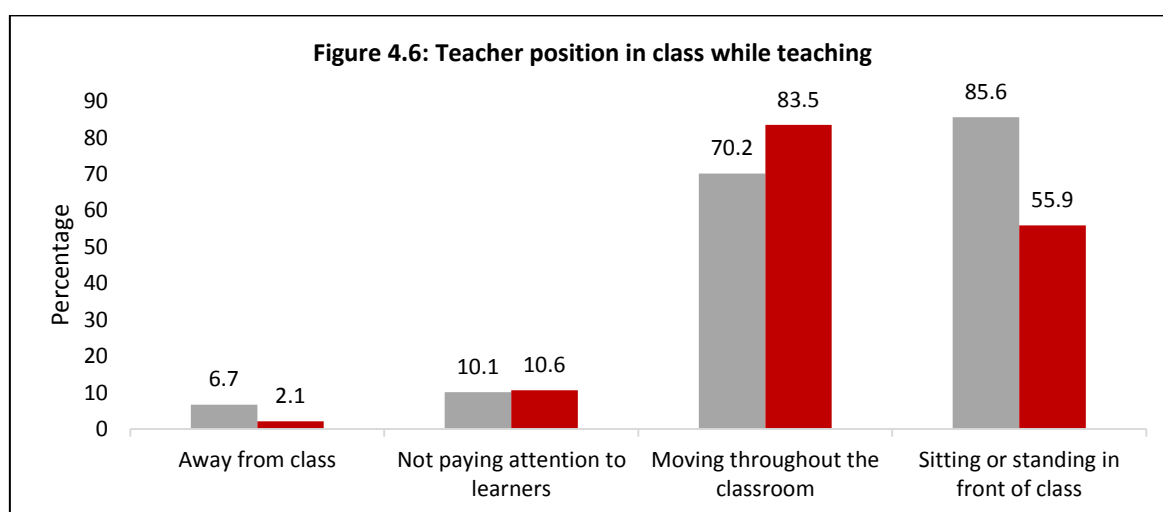
4.2.11 Teacher Monitoring and Support

From the onset, RTS groomed school head teachers and other senior teaching staff to become instructional leaders and continuously coach their teachers to ensure quality in teaching and learning. At endline, more teachers (91.8%) than at baseline (81.0%) reported having received guidance and mentorship from school head teachers. For example, 88.9% of all teachers were observed teaching a reading lesson compared to 60.8% at baseline. Classroom observations were mostly conducted by head teachers (56.7%) compared to 16.2% by another teacher, 2.7% of zone officials, 6.2% of staff from district education office while other observers constituted 18.2%. The results showed that district staff conduct more observations than zone officials. Going forward, the trend should reverse so that more zone officials provide necessary support to teachers given they are closest to schools. The challenge facing most zone officials was lack of transportation especially in schools that are geographically spread out. All observations in the school year were followed by discussions with observers at the end of the lesson. The majority of teachers (87.5%) compared to 82.5% at baseline said feedback was useful. Teachers are usually observed monthly (42%) and termly (37%). Based on results, it can be stated that there were noticeable improvements in the way the school leadership, zone head teachers support teachers as evidenced by increased EGRA scores at endline.

4.2.12 Teacher Continuous Professional Development (CPD)

Teacher CPD is about providing a conducive environment for ongoing learning and skills enhancement. In the survey, teachers were asked different questions about learning opportunities within the system. Similar to results in preceding sections, improved performance was recorded in school level professional development. For example, the proportion of teachers reported having received support and training in how to teach reading using phonics/letter sounds increased from 61.9% at baseline to 82.8% at endline. Figure 8 has details. In addition, about three quarters (75%) of the teachers received their training in how to teach phonics between 2013 and 2016. This was the time when RTS had intensive capacity building activities across its target provinces. Results of the endline survey may be indicative of RTS project efforts.

Figure 4.7: Teachers that reported receiving training in how to teach phonics or letter sounds (%)

Baseline: 61.9
Endline: 82.8
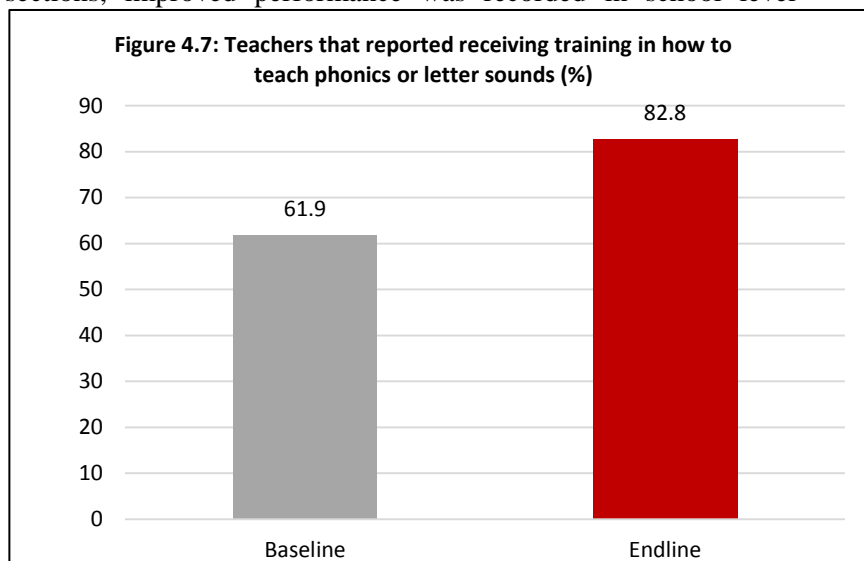
Improved performance was also recorded in respect to holding Teacher Group Meetings (TGMs) as it increased from 83.9% at baseline to 93.9% at endline. Teachers reported that they mostly hold TGMs on a weekly basis (33.8% slightly down from 35.7% baseline, weekly 31.5% and termly 7%). Equally, 65.9% at endline compared to 46% of teachers at baseline said there had scheduled time for teachers to exchange ideas, share materials and plan lessons together. The TGMs are organized by school based officials (82.8% up from 47% at baseline) who include School In-service Coordinators (SICs), Head teachers, Deputy Heads and Senior Teachers and teachers. Zone and district officials accounted for 11.4% up from 4.4% at baseline. During TGMs, discussions centered on; teaching methods (91% up from 33.2% at baseline), subject content (67.7% up from 22.5% at baseline), and classroom management (45.3% up from 15.4% at baseline). Both school-based and zonal TGMs are being continuously strengthened by RTS and teachers said that they are helpful (68.5%) because they help them learn from each other. Results indicated that CPD is improving as more teachers participate with purpose and intent to share experiences relevant to their teaching and learning.

4.2.13 Teacher Interaction with Parents

Relationships among teachers and parents are vital to effective teaching and better performance of learners. Survey results revealed an increased interaction between teachers and parents from 81.4% at baseline to 92.7% at endline. Thus, more teachers reported that they meet parents to discuss learners' performance mostly on termly basis (58% up from 39.8% at baseline). Compared to baseline score of 61.2%, endline results showed that 77.3% of all teachers prepare learner progress reports which they send to parents/guardians regularly. Overall, 70.3% of teachers said they mostly send progress reports on termly basis. Equally, there was evidence around parental involvement as 68.2% of the teachers interviewed said that parents have become more proactive in learner performance management processes compared to 55.9% at baseline. In many RTS supported schools, parents ask teachers to meet to discuss their children's academic progress. With respect to whom to consult when a learner has a problem, more teachers said they consult another teacher 28.9% up from 12.1% at baseline. Teachers also consulted the head teacher 64.7% up from 51.6% at baseline, other school leaders (senior teachers/PTA/Deputy Head) 27.4.0% up from 18.4% at baseline while consultation from G&C teacher increased from 17.9% at baseline to 53.6% at endline. The results demonstrate a growing interaction and partnership between teachers and parents given that more parents are demanding accountability from teachers through reports and regular meetings. Ultimately, the result shows an emergence of shared participatory leadership in schools. This may be in part due to RTS's heightened sensitizations in schools about the role of guidance and counselling in schools.

4.2.14 Observer Reflections

As was at baseline, assessors were required to give their overall impressions of the lesson through a series of questions after classroom observation. Of all observed teachers, 73.8% at endline compared to 53.2% at baseline, taught the same lesson as indicated in the lesson plan. This shows an increased adherence to the lesson plan. Similarly, 69.7% (endline) compared to 51.7% (baseline) of class activities

Figure 4.8: Teacher performance during class observation (%)

and discussions followed the lesson plan. While only 55.6% of teachers at baseline had adequately prepared teaching and learning aids for the lesson, 78.2% of the teachers at endline prepared teaching and learning aids for their planned lessons. Regarding the use of language in classrooms, 90% of teachers at endline taught in local language all the time compared to 69.7% at baseline. Overall, assessors noted an improved atmosphere in the class where teachers engaged learners in class activities. For example, 59.4% of teachers were courteous to learners during class and spent about 50-74% of their time doing classroom activities together or in groups as opposed to lecturing.

Teaching was also inclusive because teachers' ensured participation of both boys and girls in class activities. Observers also noted positive interactions among learners and teachers. The teachers also exercised positive discipline which helped learners to focus on given tasks. The combined assessors' rating of teacher performance in class improved from 48.5% at baseline to 59.7% at endline for teachers rated as good. Endline results also showed more teachers were rated excellent than baseline with scores of 10.6% and 4.2% respectively. See Figure 9 above for details.
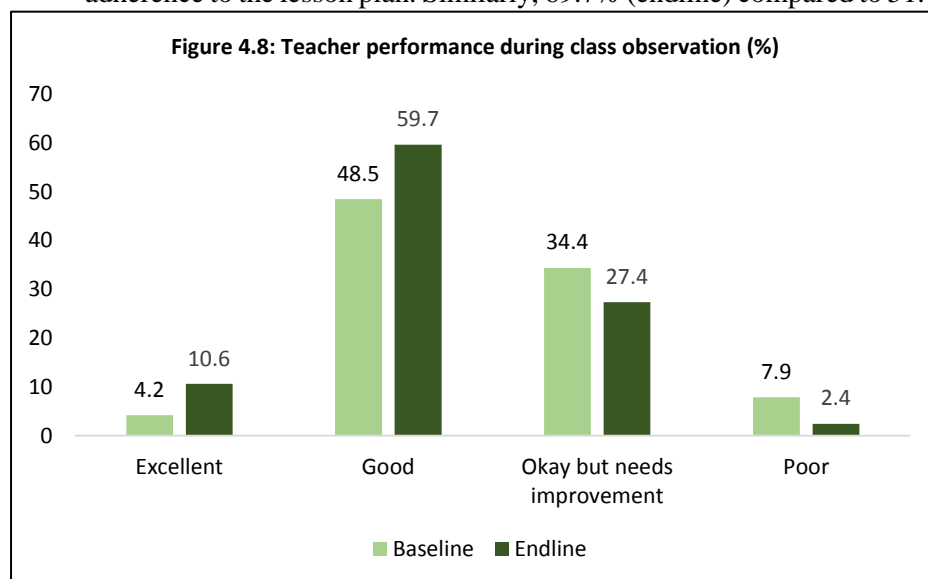
4.3 Head Teacher Performance

Headline Findings: Head Teacher Performance

- All head teachers said it is their responsibility to help teachers teach better in schools and they do it via open communication with teachers (80.0% up from 24.1% at baseline) and knowledge sharing (78.5% up from 19.4% at baseline).
- Head teachers that are trained in their role increased from 31.5% at baseline to 79.4% at endline
- Head teachers that were trained in how to teach reading using phonics increased from 81.7% at baseline to 92.1% at baseline
- Head teacher that conduct classroom observation increased from 29.6% at baseline to 85.5% at endline
- Head teachers motivate learners by giving positive feedback increased from (30% at baseline to 71.5% endline
- Head teachers that classified learners' minimum performance decreased from 64.5% at baseline to 20% at endline while desirable category increased from 8.6% at baseline to 72% at endline
- More schools (95.5%) set learner performance targets compared to 73% at baseline
- Head teachers that consult zone officials on any issue affecting the school 37.2% at baseline to 56.8% at endline
- Stronger learner support system i.e. proportion of schools with an assigned

The RTS Research Report on Effective Head Teachers indicated that "head teachers in high performing schools tend to display openness towards new ideas while maintaining an authoritative approach to leadership" (Jacob et.al 2014, p. 9). This goes to show that strong leadership by the head teacher in the day-to-day management and oversight of school programs is critical for creating an environment suitable for improved learner performance. Many school effectiveness models consider the head teacher as the central part of the process of teaching and learning improvement. Therefore head teachers are necessary in integrating effective teaching strategies and parental and community support. Like at baseline, this midline survey captured issues around head teacher's leadership such as: pedagogical (instructional) leadership with a focus on reading, school management, guidance and counseling, continuous professional development, community support, and external monitoring support from provincial and district officials.

4.3.1   Head Teacher Demographic Information
A comparison of baseline to endline results showed that there were slightly more female head teachers at endline than at baseline. At baseline, 75.6% of all head teachers were male while at endline, the proportion of male head teachers marginally dropped to 72.5%. This result demonstrates that there are still more male head teachers than female counterparts in leadership positions at school level. The above result is inconsistent with the fact that there were more female teachers at baseline 56.1% and the proportion increased to 68% at endline. From these results, it was clear that female teachers are a minority in school leadership with only 27.5% females in leadership positions despite being the majority of the teaching force in primary schools. On average, head teachers have been in their current leadership positions for 4.6 years (3.6 years at baseline). On the other hand, all head teachers have an average teaching experience of 22.4 (18.5 years at baseline). The mode duration of being a head teacher was 3 years which was an improvement from 1 year at baseline. This showed some stability and growing amount of experience in leadership positions. Almost all head teachers (99%) were in permanent and pensionable positions compared to only 1% that were in acting positions. With respect to which subjects are taught by head teachers, results show that 56.5% of head teachers at endline compared to 46% at

baseline teach all subjects. In addition, 95.5% had taught grade 1 or 2 at some point. This may still indicate substantial involvement in classroom activities which leaves them with little time for management and leadership roles. In terms of teaching qualifications, more head teachers had Primary Teachers' Certificates (27.6%), Secondary Teachers' Diploma (27.2%), and Primary Teachers' Diploma (25.6%), with only 13.8% of teachers that had a university degree. Other qualifications constituted 5.9%.

4.3.2   Focus on Reading

There is substantial involvement and focus on promotion of effective reading by head teachers in all RTS schools. For example, almost all head teachers (99.5%) said that literacy is taught as a separate subject for an average period of 53 minutes. This represents a significant change from baseline where only 25% indicated that literacy was taught as a separate subject. Evidence also indicates that teachers mainly use official local language (88.5%) all the time to teach reading as opposed to other local language (11.5%) and English (0.5%). Head teachers mostly (54.5%) think that some teachers do not use official local language to teach reading because they those teachers don't speak the local language well, hence the limitation to use it.

According to head teachers (88%), the appropriate class to start teaching English is a grade after grade 5, which is a departure from their views at baseline when they indicated grade 2. The most common reading program used by teachers is Primary Literacy Program (PLP) at 73.3%. Results also showed that 13% of teachers still use New Break Through to Literacy (NBTL) while 3.3% use Read On Course (ROC). To ensure transparency and accountability at school level, head teachers monitor reading performance mainly through lesson observation (81.5%), by examining reading test scores (61%) and sometimes through sample tests or GALA (26.5%). Responses from nearly all head teachers (98.5%) indicated that teachers should teach letter sounds in order for learners to know how to sound out (decode) letters to read words. To improve reading in schools, head teachers help their teachers to teach better, mostly through discussion during TGMs (85.5%) and lesson observations (62.5%). Compared to baseline, head teachers rated their own knowledge about how to teach early grade reading better at endline. For example, head teachers rating at endline revealed the following: very weak is 0% down from 1.5% at baseline, not so good is 2.5% down from 5.6% at baseline, average is 42.5% up from 34.0% at baseline, pretty good is 41% down from 48.7% at baseline. No head teacher rated himself/herself as excellent at baseline but at endline, there were 14% of them that rated their knowledge as excellent. In general, results show that head teachers are increasingly focusing on promotion of early grade reading in schools. Figure 4.9, summarizes head teachers' views on learner performance.

Figure 4.9: In your view, how do you classify learner performance in reading in grades 1-3?
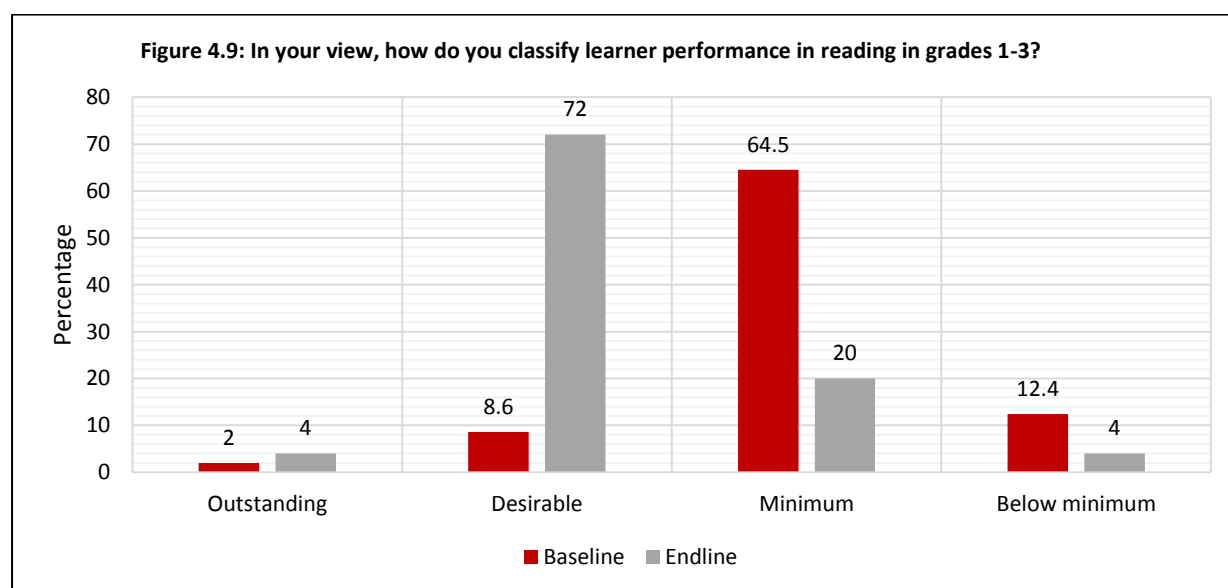
4.3.3   Pedagogical Leadership and School Management/Improvement

Over the years, head teachers adopted positive leadership practices. There is evidence that school leadership is focused on ensuring quality teaching and learning while retaining strong administrative oversight on teaching staff, learners and community members. All head teachers said it is their responsibility to help teachers teach better in schools and they do it via open communication with teachers (80.0% up from 24.1% at baseline) and knowledge sharing (78.5% up from 19.4% at baseline).

Results also show that head teachers are more actively involved in classroom activity monitoring now than at baseline especially with regards to classroom observation and coaching during TGMs. At baseline, 29.6% of head teachers reported that they assess teaching quality through classroom observations while at endline, the figure increased to 85.5%. On average, head teachers observe a classroom teacher 6.2 times in a year, which translates to about 2 observations per term. This is an improvement from the baseline figure of 3.4 times in a year. The head teacher mostly use information from classroom observation (90%) and teacher performance reviews (62.5%) to determine which classroom teachers need help with teaching. If a teacher has a problem teaching, head teachers usually observe that teacher (59%) and discuss the problem area during staff meetings (55%). In 2016 alone, 74% of head teachers had organized meetings to discuss different issues which affect teaching. There were regular interactions among teachers and head teachers mainly through Teacher Group Meetings (TGMs) which were organized bi-weekly (53.5%), monthly (29%) and termly (16%). Majority of the head teachers (94.5%) said that the topics during TGMs mainly focused on improving the quality of teaching and learning. After classroom observations, head teachers use the findings to provide feedback to teachers on their performance. Feedback is mostly given through one-on-one discussions (86.5%) with a view to provide focused support to teachers. There is still a need to improve the practice of documentation among all staff not just head teachers because many activities get done but some teachers and head teachers do not record them.

Some topics for TGMs and staff teacher meetings are derived from class observations discussions with teachers. This demonstrates more involvement of head teachers in teaching and learning processes. Teaching-learning quality is also guaranteed through regular preparation of lesson plans which are reviewed by the head teacher fortnightly. Regarding motivation, 71.5% of head teachers compared to 30% at baseline motivate learners by giving positive feedback or praises, while providing rewards/resources increased to 94% at endline from 39.8% at baseline. Other ways to motivate learners included; talking to parents (21.5%) and threaten with low marks (1%).

The school head teachers have also shown improvements in the way they manage their staff especially on enforcing accountability and discipline and the promotion of harmonious operations at the school. About a quarter (24.5%) of head teachers acknowledged that there was a problem of attendance and punctuality in their schools. However, head teachers were handling and dealing firmly with all erring teachers and learners. All unexcused absences or lateness were punished (93% at endline up from 90.9% at baseline). The majority (89%) of head teachers ensure that teachers are present in classrooms by visiting classes and at the same time head teachers mostly give warning letters (94.5% up from 51.4% at baseline) and recording the incidence (51% up from 30.1% at baseline) all unofficial excuses. Frequently absent learners are mostly dealt with by engaging parents (66.5%) and talking to them directly (67.5%). Sometimes, learners are visited at home by the head teacher (29.5%), by teachers (27%) or by PTA/community member (18.5%). Regarding allocation of teachers to grades, the commonest criterion is the teacher's knowledge of subject matter and methods at 74% up from 72.1% baseline. Overall, many schools enforce positive behavior for both learners and teachers.

There continuing efforts towards school improvements. School head teachers have integrated collective planning for school improvement as an essential ingredient for sustainability and ownership. There were 95.5% of schools that set learner performance goals compared to 73% at baseline. Specifically, 82.5% of schools developed learner improvement plans for reading. The

Table 4.12: Who sets targets		
Description	**Baseline (%)**	**Endline (%)**
Head teacher alone	2.1	4.5
Head teacher and teachers	77.1	72
Staff, learners and PTA	13.0	17
Higher education authorities	2.1	1
Other	5.7	5.5
Total	**100.0**	**100.0**

Endline Survey results further indicated that the PTA is now more involved in school management processes than they were at baseline. For example, Table 13 shows that setting learner performance targets with PTA members improved from 13.0% at baseline to 17%. The survey results also showed that schools know their needs and develop plans based on their own needs (75% up from 67.7% at baseline). The process of developing targets and operational plans is not in a vacuum but guided by reference materials and prior analysis of learner performance in previous years. For example, 78.5% of head teachers said that development of school improvement plan is informed by the Grade 2 Literacy Progress Report (G2LPR). To leverage additional resources for the school, head teachers mostly turn to DEBS office (80%) and community (57.5%, up from 33% at baseline). Parents are informed about learner performance through open days (42.5%), official report cards (28.5%) and parent teacher meetings (21.5%). Even though 80% of the meetings with PTA focus on infrastructure development, there was noted progress regarding their involvement in academic and support to instructional quality as it improved from 8.5% at baseline to 39.5% at endline. Both school authorities and PTA or parents in general are increasingly taking interest in learner performance as can be seen in their joint planning and implementation efforts.

4.3.4   Continuing   Professional   Development   (CPD)   and   External Monitoring & Support

The Endline Survey results show that the overall Continuing Professional Development (CPD) culture is fairly strong even though it needs more strengthening from district and provincial officers so that teaching and learning quality keeps improving. In-service meetings are a regular occurrence in many schools and data point to the fact that head teachers and other teachers support each other at zone level. Over the life of the project, RTS has been strengthening existing practices by working towards improving the quality of Teacher Group Meetings (TGMs) and Head teacher In-service Meetings (HIMs) so that meeting agendas increasingly focus on quality learning outcomes.

Results further point to the fact that effective and efficient CPD was a cornerstone of all RTS interventions in all supported districts. Results of the endline showed a substantial improvement with regard to CPD practices in schools. For example, the proportion of head teachers trained in how to carry out their duties increased from 31.5% at baseline to 79.4% at endline. Out of this proportion, 67.8% of head teachers were trained between 2013 and 2016. Head teachers reported that they mostly received capacity building activities at zone or district level (56.3%) while others said they went to college and university 15.6% and 6.5% respectively. From the result, CPD mostly take place at zone and/or district level, clearly highlighting the role of zone and district officials that are charged with the responsibility of capacity building. Future capacity building initiatives should more intensely focus on improving the capacity of zone and districts officials. With regards to specific training in how to teach reading using phonics or letter sounds, 92.1% of head teachers at endline said they had received training compared to 81.7% at baseline. The Endline Survey results showed that on average, a head teacher attends 3 zonal CPD activities in a school year which was 1 activity per term. According to head teachers, zonal CPD activities are helpful to a large extent for both teachers and head teachers (88.9% up from 52.7% at baseline). The CPD activities mostly helped head teachers to learn new teaching methods (62.8%), learn about management methods (67.3%) and learn about new administrative procedures (65.8%).

On external visits and support, survey results indicated that each school in RTS targeted provinces is visited 4 times (3 times at baseline) by a district or provincial official in a school year compared to 2 visits (1 at baseline) from a zone official. Head teachers described the visits as very useful (68.8% up from 49% at baseline) as they contributed to improving quality of teaching and learning in schools.

With regard to purposes of visits, zone officials focus more on school in-service monitoring (50.8% up from 40.5% at baseline) in comparison to in-service monitoring done district and provincial officials (45.7% up from 38.9% at baseline). The results indicate that there is more reliance on structures closest to schools and head teachers mostly consult zonal head teachers or ZICS (56.8% up from 37.2% at baseline) compared to 19.1% from district officials (slightly up from 17.2% at baseline). According to head teachers, support from district and provincial officials is mostly in form of courtesy call visits and exam center inspections while zone officials largely focus on mentoring teachers and improving quality of teaching and learning in schools.

4.3.5   Guidance & Counseling and Community Support

Guidance and Counseling (G&C) is important for a child's wellbeing. By definition, "it is the process by which learners are given life skills on how to deal with emotional conflicts and personal problems, both in school and how to incorporate the same in their daily life"[13].

For RTS, G&C is important because it helps learners to effectively deal with factors in the environment that affect their concentration at school. By promoting effective G&C in schools, RTS set out to help learners focus on transformative learning and thereby improve learning achievements. During the endline survey, key questions were asked to head teachers on the types/services offered in schools and some summary results are presented in the following sub-sections.

At endline, results showed that most (97.5% up from 84.5% at baseline) of all schools in RTS provinces have a teacher specifically assigned to handle G&C activities in the school. Further, endline results show a reduction in the proportion of G&C teachers with other teaching responsibilities from 97.5% at baseline to 94.5% at endline, demonstrating a shift towards promotion of G&C services. On average, G&C teachers offer G&C services for 6 hours in a week. Equally, the proportion of trained G&C teachers increased from 33.3% at baseline to 44.7% at endline, leading to a coordinated approach where Agents of Change receive mentorship from G&C teachers before they engage their peers. Even if a school has no trained G&C teacher, interviews with teachers revealed that G&C services were still provided by other teachers and some members of the community.

Results further showed that there was active engagement of parents guardians on learner support services and they get to know that G&C services exist in a school mostly through PTA meetings (73 % up from 26.6% at baseline).

The above results demonstrates more engagement with the community as PTA forums are also used to discuss other teaching and learning activities which ultimately help parents to track learner achievements in schools thereby enhancing teacher accountability. With regard to provision of special services, learners with behavioral problems and those at risk of dropping out of school receive more attention i.e. 83.5% (16.9% at baseline) and 62.5% (12.5% at baseline) respectively. Table 4.13 gives more details.

Table 4.13: Types of G&C services available at school visa-a-vise those uniquely offered to girls

Type of service offered to all learners	BL%	EL%	Program or service offered to girls	BL%	EL%
Career counseling	16.2	39.5	Career counseling	2.1	63.5
Personal counseling	25.4	70.5	Personal counseling	30.1	53
Life skills education	18.8	71.5	Life skills education	18.9	45.5
HIV/AIDS prevention	22.6	55.5	HIV/AIDS prevention	22.9	71
Tutoring/ remediation	1.6	15.5	Reproductive health	NA	24.5
Afterschool recreation/ clubs	5.2	34	Afterschool recreation/ clubs	5.5	8
Feeding program	2.3	23	Feeding program	1.7	13.5
Scholarship/ financial assistance	4.3	20	Scholarship/ financial assistance	3.2	16.5
Mentoring	3.0	16	Mentoring	3.4	10.5

Key: BL = Baseline and EL = Endline

Results demonstrated that all measured parameters had a positive trajectory with at least two-fold changes. In relation to the Re-Entry Policy, almost all head teachers (99% up from 98.9% at baseline) are aware about it and they clearly explained that girls who get pregnant should be allowed back in school and be given necessary support after they deliver.

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[13] http://www.writing.wikinut.com/importance-of-guidance-and-counselling-in-schools./2j9-q09s/

Community support was regarded as crucial in all RTS interventions. Scholars agree that the role of the community in improving learner performance and ensuring accountability cannot be overemphasized. *Postlethwaitie and Rose, (1992)* pointed out that, in many countries, the more the school head teacher and other teachers have contact with parents, the more effective the school was in promoting the reading achievement of pupils. This shows that parent-teacher interactions play an essential role in promoting better learner performance.

All schools (100%) confirmed presence of a Parent-Teacher Association (PTA) or School Community Partnership Committees (SCPC) at their schools compared to 96.9% at baseline. Further, survey results showed that in all schools, meetings between school authorities and PTA mostly happen every term and on average 130 members of the community that attend every time a meeting is called in a term. Sometimes the number of community members that attend a meeting is as large as 500 people in one sitting. Even though some parents and members of the community still focus more on infrastructure development in their schools, there is a growing shift towards promoting actual teaching and learning quality as it improved from 20.4% at baseline to 53.5% at endline. This represents a growing appreciation for the value that parents place on learner performance.

The level of collaboration between head teachers and PTAs were evident in the joint activities that they undertook such as development of the school improvement plan, interpretation of results using Talking Wall Posters (62%) and the enforcement of homework policy. Given the demand in schools and the need for continued support, head teachers still want more support as they think the current PTA or SCPC support is not sufficient to achieve the objectives of school improvement plans. In fact, results showed stagnation as only 45% of head teachers at both baseline and endline felt that the current support is sufficient in light of the fact that PTAs have insufficient resources and members usually do not show full commitment to school projects.

4.4 General School Information

This section of the report presents general school information in the six provinces. This information is important for contextual understanding of factors that affect teaching and learning processes in the schools. According to results, on average, most of schools were located about 48 kilometers from the DEBS office, which classifies them as either rural or remote thereby making them difficult to monitor at certain times of the year particularly in the rainy season. Compared to baseline, endline results showed some positive changes with regard to infrastructure and access to amenities such as electricity 38.5% (10.9% at baseline), access to running water at 19.5% (8.9% at baseline). Access to school libraries improved from 7.6% baseline to 20.5% at endline while access to playgrounds improved from 59.9% at baseline to 95.5% at endline. For toilets, the survey found that on average, there were 4 (2 at baseline) functional toilets for either girls or boys. The data showed that the, the average enrolment per school was 510 learners. This results into an estimated average toilet ratio of 1:128 (1:140 at baseline) for both girls and boys. This is below the recommended government policy standard pupil toilet- ratio[14] of 1:40 for boys and 1:25 for girls.

The notable changes may be due to collective efforts among government, community members, civil society and other players that promoted a holistic approach of providing education. At endline, 61.3% of all schools (55.5% at baseline) received some support from NGOs others than RTS. The support was mostly in the form of HIV/AIDS information dissemination, scholarships, textbook supplies, water and sanitation activities, child rights information with a special focus on girls' education. Support to libraries significantly improved from 2.9% at baseline to 8.5% at endline which indicates a general momentum among players in the education sector towards improving literacy.

According to the SACMEQ (1998) Policy Research Report No.5 of 1998, there are no Ministry guidelines for school size[15]. Instead, school size and enrolment are determined by demand in a given

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[14] Reported as advised by USAID funded SPLASH Project

[15] "There are no Ministry guidelines for school size. Instead, school size and enrolment are determined by demand in a given locality. The classification of school categories is determined by the number of classes as follows:

locality. The average primary school class size for 2015/16 year was 42 learners in grade one, 39 in grade two, 39 in grade three, 39 in grade four, 34 in grade five, 31 in grade six and 30 in grade seven. The data confirms the general view that there are large classes at grade one and thereafter, numbers gradually fall due to dropouts as fewer learners progress to higher grades.

The overall dropout rate is below 2%, compared to 5% at the start of the project. The biggest dropout was observed in grade 5 at 6.6%. The dropout rates for both sexes were not significantly different. However, in the lower grades, more boys than girls dropout compared to grade 7 where slightly more girls dropped out. In terms of performance, boys did better at grade seven examinations than girls (85% compared to 72% pass rate).

General attendance rate was about 70% (up from about 60% at baseline) for both learners and teachers though attendance of female teachers is much lower (64% compared to their male counterparts at 69%). Head teachers noted that female teachers are more affected by the rural/remote environment and therefore stay away from school most of the times. The number of OVC dropped from an average of 27 at baseline to 5 at endline. No major differences were noted with regard to school-based support (such as text books and uniforms) provided to boys and girls. The holistic analysis of school statistics demonstrate that the school environment has improved as more support is being provided to the learners by different stakeholders leading to improved learner performance in many schools.

Ungraded schools: 1 - 4 classes, Grade 3 schools: 5 - 11 classes, Grade 4 schools: 12 - 21 classes, Grade 2 schools: 22 – 31 classes, Grade 1 school: 32 - and more classes".

4.5   MOGE Officials Support to Schools

Headline Findings: MOGE Officials

- All head teachers said it is their responsibility to help teachers teach better in schools and they do it via open communication with teachers (80.0% up from 24.1% at baseline) and knowledge sharing (78.5% up from 19.4% at baseline).
- Many officials (91%) demonstrated understanding of how to teach reading in schools.
- Most officials (74.4%) know that the common method of teaching reading in schools is sounding out letters and decode words as opposed to memorizing (11.6%) and reciting words (25.6%).
- More officials (86%) compared to 29% at baseline personally use information they gather from schools to monitor implementation of school plans.
- More officials, 83.7% (45% at baseline) think that head teachers are willing to plan because they feel that their school can change for the better
- Official valued external support from zone officials towards school monitoring 95.3% (up from 69% at baseline)
- Major challenge in school with respect to teaching of reading is shortage of

RTS worked towards galvanizing efforts at all levels. MOGE district and provincial officials were specifically targeted to provide an environment which impact positively on learner performance. As instructional leaders, officials provided coaching and support and were responsible for establishing and communicating clear goals and expectations for learning achievements in all schools. This section sheds more light on how government officials supported primary schools, particularly with respect to promotion of early grade reading.
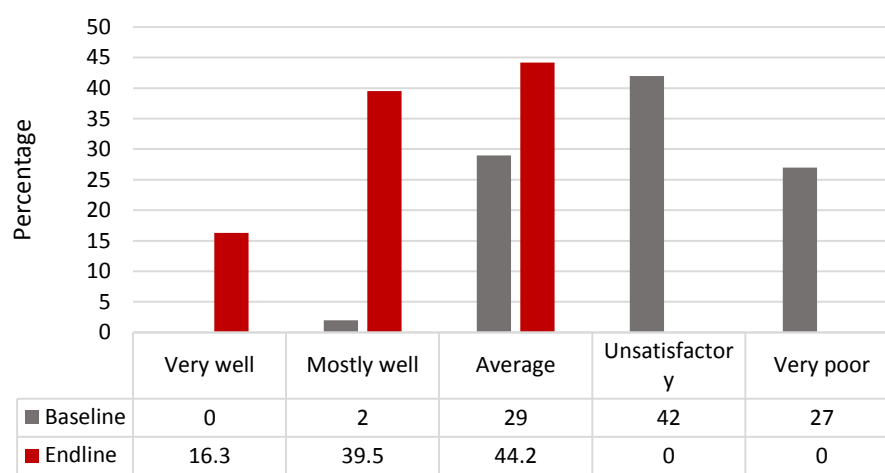
4.5.1   Demographics

The survey captures a total of 43 officials and they comprised standards officers, District Education Board Secretary (DEBS), District Planning Officer (DPO) as well as District and Provincial Resources Center Coordinators (DRCCs/PRCCs). Like at baseline Endline Survey results showed that there are still more male than female officers holding key district and provincial positions i.e. 67.4% males (73% at baseline) and 32.6% females (27% at baseline). This result showed a slight improvement from baseline, but it does not eliminate gender imbalances in leadership positions. With regards to the number of years of service, interviewed officials have an average of 4.5 years in their current positions with the longest having served 18 years. Only 52% (49% at baseline) of the officials had been trained specifically for their role in the current position. The majority 72.1% (56.1% at baseline) had previous experience in teaching young children to read with 79.1% (66% at baseline) having received training in how to teach reading effectively.

4.5.2   *Focus on Reading*

At endline, 90.7% of all interviewed officials demonstrated understanding of how to teach reading effectively using the PLP approach. This is because they had previous experience in PRP which was a forerunner to PLP. They indicated that it was easy to use their experiences under PRP to transition to PLP. Generally, they are in command of how teaching is implemented in schools. For example, they are aware that schools set aside time for teaching reading (95%) and they further know that schools use the official local language as a medium of instruction for grades 1 and 2. However some officials (about 6% down from 35% at baseline) still think that teachers use English to teach grades 3 and 4 respectively. For the teachers who fail to use local languages, officials said that this may be because of their inability to speak the language and the absence of sufficient local language materials/books makes it difficult to effectively master the local language. In addition, most officials (74.4%) know that the common method

of teaching reading in schools is sounding letters and decode words as opposed to memorizing (11.6%) or reciting words (25.6%). In their opinion, both district and provincial officials said that 16.3%, (0% at baseline) of grades 1-3 are performing very well in reading. See Figure 11 for details. According to officials, the major challenge faced by schools in the teaching of reading is shortage

Figure 4.10: Officials' opinion about grades 1-3 performance in reading

	Very well	Mostly well	Average	Unsatisfactory	Very poor
Baseline	0	2	29	42	27
Endline	16.3	39.5	44.2	0	0

of materials (86%) and poor teaching practices (39.5%). This perception may suggest that some officials still look at shortage of materials as the most significant factor hindering school effectiveness. This view works against a culture of resourcefulness among teachers and school administrators. The survey results also indicated that support from officials was mostly provided on a quarterly/termly basis; be it training, provision of materials, monitoring or meeting with parents to discuss community and family problems.. Overall, interviews with officials revealed that they have sufficient foundation knowledge in how to effectively teach reading in schools and that they engage with schools more than before.

4.5.3   *School Information and Planning*

Interviews with all officials revealed that many district and provincial officers consider school information as a critical ingredient of planning, especially as it relates to improving learner performance in reading. Further, survey results indicated that officials ensure that schools develop school strategic plans and learner performance plans with the help of the community members. Other written plans in the school include teachers' plans, infrastructure improvement plan and School In-service Program for Term (SPRINT). The key people involved in data collection, information processing were zone officials who later pass it on to district offices for aggregation and higher level analysis. The sources of information for planning for district and provincial officials were mostly grade 7 results (93%, up from 55.9% at baseline), term test results 52% (41.2% at baseline), Grade 2 Literacy Progress Report 71% (64.7% at mid-term) and information from the Red Level Tracker[16] (74%, up from 61.8% at baseline). There were 65% of officials that said analyzing results from schools was part of their regular job. This is improvement from 39% at baseline. Officials mostly analyze information from schools for purposes of identifying individual schools for corrective action (86%), identifying good practices (72.1%) and

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[16] The Red Level Tracker is an assessment system of categorizing learner performance. Least performers are in Red, learners at minimum are in Yellow, those at desirable are in Green and outstanding learners are in Blue. Since the focus is on helping those in Red, hence the name Red Level Tracker

identifying general needs for future planning (69.8%). The proportion of officials personally use information they gather from schools improved from 29% at baseline to 86% at endline. The information is mostly used for discussing problems or resources at zonal meetings of head teachers (83.7%) for planning zonal CPD activities (81.4%) and for discussing success stories during zonal training.
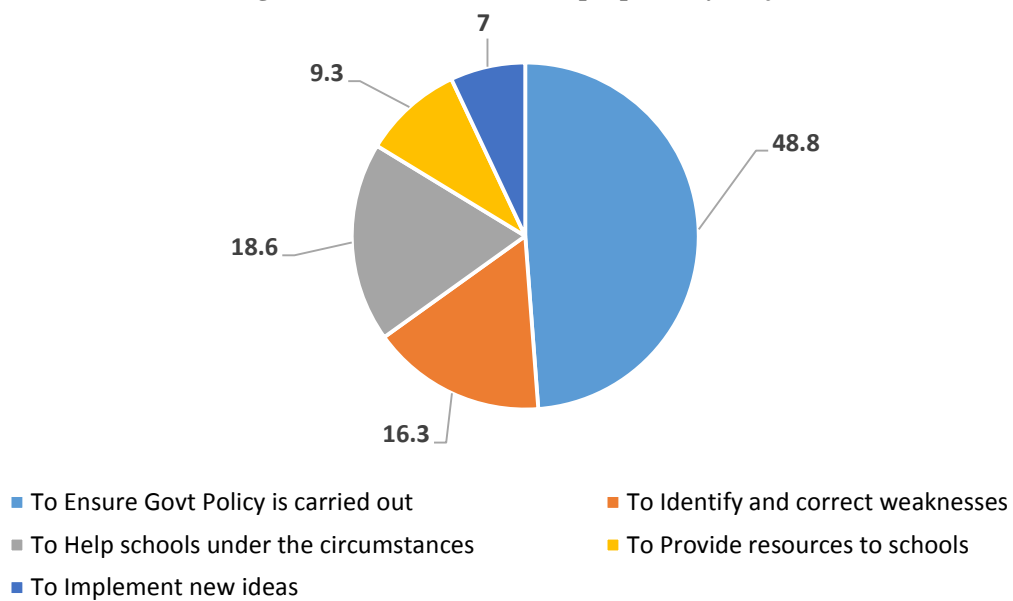
In assessing head teachers' attitudes towards planning, 83.7% (45% at baseline) of all officials said that head teachers are willing to plan because they feel that their school can change for the better. The survey further revealed that 72.1% of all officials personally use school plans in their work to monitor SPRINT activities and implementation of all school plans. About 7% of officials (25% at baseline) were for the view that head teachers see no point in planning because they do not have the resources to do anything new. Further analysis of the endline survey data showed that officials are increasingly working together with school authorities and the community in developing school improvement plans. The team approach to collective planning and implementation of activities in schools is slowly but steadily paying off as learners have shown improvement in performance.

4.5.4   Monitoring and Support

There were 79.1% of officials who said they consider school monitoring as a regular part of their job while 11.6% said almost all their time was spent on school visits. Easy accessibility (60.5%, up from 55.9% at baseline) and amount of complaints received from a school (53.5% down from 58.8% at baseline) are the two most common factors which determine which school an official should visit. This was supported by a large proportion of officials (88.4%) who agreed that schools do get an equal share of such visits. When school visits are conducted, officials regularly do the following activities; observe lessons (48.8%), check school records (53.5%), sample children's written work (53.5%), listen to children reading (46.5%), check teacher lesson plans (58.1%), check teacher assessment records (51.2%), advise teachers on their work (44.2%), advise head teachers on their work (58.1%), discuss school matters with PTA/SCPC (30.2%), check implementation of school plans (53.5%), and talk to learners about issues related to their learning (46.5%). For the most part, feedback support is given in form of advice to individual teachers and head teachers, and written reports which are often shared with superiors (74.4% up from 61.8% at baseline) and colleagues (53.5% up from 41.2% at baseline). Overall, officials said their support to schools makes a big difference (48.8%) while 44.2% of all officials said it only makes a difference with individuals who are prepared to listen.

There was improved support to zones by district and provincial officials towards school monitoring, rising to 95.3% at endline from 69% at baseline. And 72.1% of district and provincial officials said mostly visit schools once per term. They rated them as highly effective 18.6% (0% at baseline), quite effective 62.8% (53% at baseline), partly effective 14% (41% at baseline). None was rated as not effective, which is an improvement from 6% at baseline. Survey results showed that zone officials frequently visit schools to strengthen SPRINT activities. This kind of support has strengthened the link between schools and zone resource centers which now act as a key entry point to resolving teaching and learning problems. Overall, the officials are actively involved in efforts to improve learner performance in their respective places. This reflects a growing positive attitude that can bring about accountability in the teaching and learning processes, thereby improving learner performance in schools. Figure 4.11 summarizes what officials thought were their main duties.

Figure 4.11: What is the main purpose of your job?

- To Ensure Govt Policy is carried out
- To Identify and correct weaknesses
- To Help schools under the circumstances
- To Provide resources to schools
- To Implement new ideas

5   CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

When compared to baseline information, the Endline Survey results demonstrated that learner performance improved significantly. This was because more learners had mastered the basics in letter naming and letter sounds with noticeable improvements in decoding and oral reading fluency. The study noted that the most critical foundation reading skills have been established. As shown by results of this survey, letter name identification, letter sounds and basic reading abilities have improved. This change may be indicative of improving pedagogical practices noted among teachers. In other words, the current methods of teaching reading produced positive results and still have potential to produce even better results in future. The survey concluded that the skill least improved is reading comprehension as it had the lowest scores. Clearly, this is an area that requires more attention beyond the life of the RTS Project. Performance in reading comprehension was positively correlated to availability of reading materials. Thus, in schools that had more reading materials, EGRA scores were relative high.

Despite the significant changes in performance that occurred between baseline and endline, there are still a lot of learners that fall short of required skills to read and comprehend grade level text. With only 14.6% of grade two learners reading at the proposed government standard of 20 cwpm, this report concluded that even though progress has been recorded a lot more still needs to be done to achieve desired reading outcomes. To see real meaningful change in learner performance, more resources will be required for teacher training, material development and leadership transformation mentorship activities. Stakeholders should also reduce their expectations as the duration within which significant results will be seen extends beyond five years, the period in which the RTS project was implemented.

With regards to school effectiveness, more teachers demonstrated desirable pedagogical practices such as lesson planning, development of teaching aids from local materials, using interactive teaching techniques, conducting regular assessments and engaging with parents and community to discuss learner performance improvement strategies. In addition, head teachers provided close supervision of teachers particularly with respect to classroom observations. Zone officials were more active as they organized CPD meetings and visited individual schools more regularly to provide onsite coaching and mentorship. District and provincial officials provided regular support to schools leading to improving learner performance in many schools. Officials held more regular reflection meetings about learner performance in their districts and provinces where they discussed how to do more with fewer resources, with specific focus on improving efficiency in schools. Overall, the evidence shows improvements in many areas of school management. There is room for more system improvements that could lead to lasting positive changes in the Zambian schools.

The survey results further showed that with the right kind of consistent support, teachers are capable of working with bare minimum resources and still improve learner performance. Many RTS supported schools are like any other government primary schools where resources are scarce. However, many teachers in RTS supported schools demonstrated that creativity is key to solving the problem of insufficient teaching and reading materials in schools. Schools leaders, the community and district officials focused on developing the right attitude in teachers so that they not only apply the right pedagogical principles but also have the stamina to work efficiently and effectively in resource constrained environment. The use of TALULAR was recorded in all survey schools.

Regarding practices of head teachers' results led to the conclusion that there is a general understanding that good leadership is critical in service delivery. The notable changes in learner performance may largely be a result of improved instructional leadership exhibited by many head teachers in RTS schools. For example, there were more head teachers conducting classroom observations at endline than at baseline. In fact, performance in this aspect improved by 56% from 29.6% at baseline to 85.5% at endline. Other aspects such as using assessment data, promoting TGMs, developing performance plans and engaging communities all hinge on the leadership qualities of the head teacher. This survey concluded that training head teachers in their current leadership roles was paramount because it helped them to merge both the pedagogical and administrative functions of school management for improved teaching and learning in schools.

Related to the above, results showed that zone, district and provincial officials increased their supervisory visits which contributed to improved performance in schools. Results also showed that continuous engagement with zone officials helped to create a link between schools and the MOGE staff at district and provincial offices. The survey concluded that effective coordination between zone officials and provincial staff will guarantee appropriate support to schools as this is a structure which is closest to the school. The linkage with zone official helped MOGE officials to stay current with information from schools as evidenced by more officials who personally use data from schools for planning and decision making.

5.2 Recommendations

1. ***Increased investment in the production and distribution of reading materials:*** all stakeholders and the private sector should work towards production and distribution of appropriate reading materials in schools. This is important because many learners have grasped basic letter sounds and decoding skills which equip them for actual reading. The more materials they read, the better for their sequential reading skills development.

2. ***Emphasize more on teaching reading of sentences:*** This is similar to the above recommendation. Since learners have acquired foundational skills, it is imperative that teachers focus on teaching how to read full words or sentences so that they incrementally develop their reading skills to maturity level. This will enhance oral reading fluency and improve comprehension levels.

3. ***Enforce homework policy at school level:*** Stricter adherence to Homework Policy entails more practice for learners leading to mastery of reading skills and improved performance. More systematic enforcement of home coupled with sensitizations to parents and community about their role will increase stakeholder participation in learner processes.

4. ***Strengthen school-based coaching***: As Endline Survey results showed, supporting teachers and head teachers particularly through zonal structures is effective. It promotes stronger CPD activities particularly through TGMs. Therefore, district and provincial staff should play a supportive role in ensuring that CPD at school is strengthened.

5. ***Increase use of assessment data to improve teaching and learning:*** Teachers should be supported to improve both assessment of learning and assessment for learning. More importantly, teachers and school leadership be encouraged to use assessment data for strategic decision making. Assessment data should be one of the guiding yardsticks during TGM discussions for purposes of accountability and more focused learner support.

6. ***Encourage more parental involvement in learners' academic processes:*** Besides participation in school infrastructure projects, more parental involvement in academic processes will increase practice time for learners because the home will become an extension of the school setting. Subsequently, more learners will improve their skill mastery leading to improved performance in fluency and comprehension.

7. ***Invest into counter-factual randomized research:*** To get to the core of factors that affect teaching learning in schools especially in early grades, MOGE should commission research studies aimed at generating evidence relevant for policy making.

8. ***Implementation horizon:*** It takes long to see results of education interventions. Therefore, future programs should have a longer implementation horizon so that impact can be seen.

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